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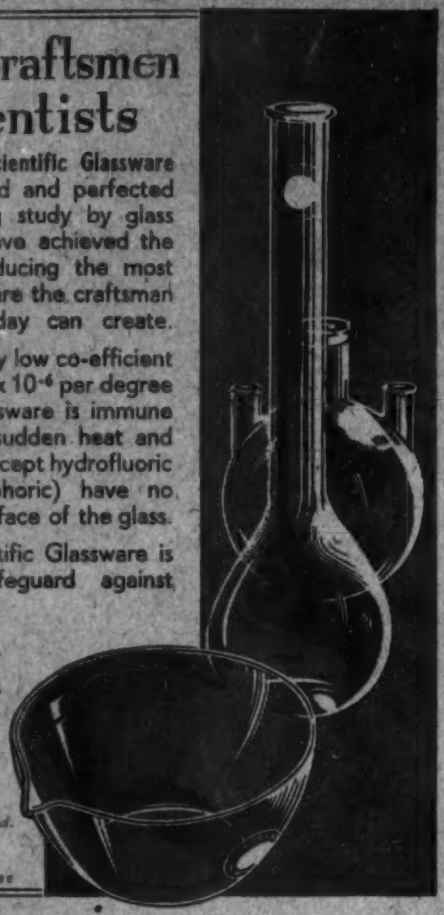

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 23 1947

CHRONIC HYPERTENSION AND PREGNANCY*

BY

F. J. BROWNE, M.D., D.Sc., F.R.C.S.Ed., F.R.C.O.G.

Emeritus Professor of Obstetrics and Gynaecology, University of London; Consulting Obstetric Surgeon, University College Hospital, London

Siward. Had he his hurts before?
Rosse. Ay, on the front.
Siward. Why then, God's soldier be he!
Had I as many sons as I have hairs,
I would not wish them to a fairer death.

MACBETH, Act 5, sc. 7.

Until comparatively few years ago discussion of the clinical features of the toxaemias of pregnancy and concerning their aetiology laid the chief emphasis on the state of the kidney and the presence or absence of albumin in the urine. Little or no attention was paid to the vascular changes which we now know to be one of the essential features and one of the earliest disturbances in pre-eclamptic toxaemia. Thanks to numerous investigators considerable progress has been made in elucidating its causes, though much still remains to be learnt.

I do not propose to discuss the causes of this hypertension, but rather to consider pregnancy as it occurs in the woman who before her pregnancy starts is the subject of chronic hypertensive vascular disease. Its importance will be apparent from the fact that these patients constitute about 25% of all cases of "toxaemia of pregnancy." Pre-eclamptic toxaemia is much more common, contributing about 70%, while chronic glomerular nephritis in pregnancy (sometimes badly named "nephritic toxaemia") is the rarest of all—about 5%. Notwithstanding the frequency of chronic hypertension in pregnancy it has received little attention in obstetric literature. This is, I think, due partly to the fact that obstetricians have confused the condition with "chronic nephritis"—with which, however, it has nothing in common—and partly because it is only in recent years that through antenatal care there have been opportunities for the study of women in the early weeks of pregnancy and that the recording of blood-pressure readings at these early antenatal visits has become routine.

The Standard of Normal Blood Pressure

A definition of chronic hypertension will depend on one's ideas as to what is the standard of normal blood pressure. Reid and Teel (1939) take the standard as 140/90. Chesley and Annitto (1947) also adopt this standard, but they ignore the reading at the first antenatal examination. On the other hand they include all cases in which this level is reached before the 24th week of pregnancy. Henry (1936) showed that the blood pressure in normal pregnancy tends to be lower than in the non-pregnant state. This is especially true of the diastolic pressure, and as a result the pulse pressure tends to be 10 mm. greater than in the non-pregnant. He regards this as a mechanism by which the heart is enabled to meet the increased demands made on it by the increase in blood volume and vascular area of normal pregnancy.

For many years we in the Obstetric Unit of University College Hospital adopted the standard 130/70 for the normal pregnant woman. Since 1940, influenced by the work of Robinson and Brucer (1939, 1940), we have used the standard 120/80. These workers showed that: (1) the normal range of blood pressure is 90 to 120 systolic and 60 to 80 diastolic; (2) blood pressure does not rise with age in normal persons but it does in hypertensive and pre-hypertensive persons; (3) a history of blood pressure above 120 systolic and 80 diastolic over a ten-year period is pathological, and an almost infallible sign of incipient hypertension; (4) transient rises of blood pressure should not be ignored and should lead one to suspect a further permanent rise; (5) slightly over 40% of the population (in the U.S.A.) is either actually or potentially hypertensive. It is usual for obstetricians to adopt 140/90 as the standard of normal blood pressure, but I believe that this is much too high and that if this standard is adopted many pregnant women with chronic hypertension will be overlooked and disaster may occur, or disaster that has previously occurred will remain unexplained. Some of my own most interesting and instructive cases of chronic hypertension in pregnancy had blood pressures under 140/90 when pregnancy began, and the diagnosis would have been missed had the usual standard been adopted. An example is Mrs. M., referred to later. It is customary, too, in antenatal clinics to ignore the first reading of blood pressure if it is found to be high. The patient is allowed to rest, and then a second reading is taken, and if it is lower, as it generally is, this is recorded as the true level. I believe that this is wrong and that the first reading is significant and should be recorded, though there is of course no harm in taking it again after rest and recording that also. Indeed, if the second reading is lower it may have a prognostic significance, as we shall see later. The blood pressure of the normal pregnant woman does not rise significantly with nervousness. If it does she is hypertensive or potentially so. I described this condition in 1933 as the "early warning rise of blood pressure" and showed that in 65% of such women the blood pressure later in pregnancy became permanently elevated.

* William Meredith Fletcher Shaw Memorial Lecture delivered at the Royal College of Obstetricians and Gynaecologists, London, on July 4, 1947.

Diagnosis

The patient may be known to have chronic hypertension before the pregnancy began. It may have followed on a previous eclampsia or pre-eclamptic toxaemia, though whether it is the *result* of these disorders is doubtful. There is evidence that such patients would have developed hypertension had they never been pregnant. Josephine Barnes and I (1945) in a study of the relatives of these women showed that in the patient who has chronic hypertension in pregnancy there is a familial tendency to the disease, as shown by its high incidence in blood relatives, while in pre-eclamptic toxaemia there is no such tendency, though I suspect that there is in subjects of pre-eclamptic toxaemia and eclampsia who after these disorders develop chronic hypertension. This view receives support from the work of G. W. Theobald (1933), who has shown that the death rate from chronic vascular hypertensive disease is not any higher among married than among single women. Whether the onset of the disease is hastened by eclampsia or pre-eclamptic toxaemia so that it appears at an earlier age than it would otherwise have done is a nice point for discussion.

The majority of patients, however, have not been under observation before they book at the antenatal clinic, and the possibility of diagnosis will then depend on the stage of pregnancy at which the hypertension is discovered. Chesley and Annitto (1947), as I have pointed out, take 24 weeks as the borderline. I have always placed it at 20 weeks. If the blood pressure is raised above the standard for the first time after that period the case is classed as " pre-eclamptic toxaemia " ; if before it, as " chronic hypertension." Sometimes the patient is seen for the first time after the 20th week, and then in the absence of a previous history classification is impossible between chronic hypertension and pre-eclamptic toxaemia.

Clinical Features

The pregnant woman with chronic hypertension is generally somewhat older than usual: in my last series the average age was 30.2 years as compared with 27.9 years for all pregnant women. She usually feels well, there is no oedema or albuminuria, and kidney function tests do not show any deficiency except in the most severe type of case. If there has been a previous pregnancy it has often ended in stillbirth or abortion. In my last series of 194 cases between 1942 and 1946, analysed for this lecture, there were 48 multiparae, who between them had 78 pregnancies but only 27 live infants—a foetal loss of 65.3%. It is of interest to note in passing that these same 48 women in their present pregnancy—that is, the one under observation and supervision—produced 45 live and surviving infants—93.7%, a foetal wastage of only 6.3%. This may be a tribute to the value of antenatal care in these cases.

Fall of Blood Pressure in the Second Trimester.—It is curious that in a certain proportion of cases of chronic hypertension in pregnancy the blood pressure falls in the second three months. This phenomenon was first noted by Reid and Teel (1939) and was confirmed by Chesley and Annitto (1947), who found that a decrease of 20 mm. Hg systolic occurred in 39.6%. In 11.3% the fall exceeded 40 mm. Hg, while in 50% there was no change. In my last series of 194 cases it fell in the second three months in 40%. The cause of the fall is not definitely known. Apparently it always occurs in pregnant hypertensive dogs, and Rodbard and Katz (1944) suggest that it is related to the low-resistance circuit that develops during pregnancy. As Chesley and Annitto (1947) point out, this mid-pregnancy fall is important in relation to diagnosis, for if the patient has not been seen early in pregnancy pre-eclamptic toxaemia is apt to be diagnosed. We shall see later that it has also some bearing on prognosis.

Exacerbation of Hypertension in Later Months.—Whether or not this fall in blood pressure occurs in mid-pregnancy the tendency is for a rise to take place in the later weeks. This may happen in the middle three months, but as a rule it does not set in till the 25th week or even much later, and it may not occur at all. In my last series of 194 cases it occurred in 54%. In the first series reported by Browne and Dodds (1942) it happened in 61%.

Relation of Blood Pressure to Albuminuria and Foetal Death

If and when the blood pressure reaches 160 mm. Hg systolic, albuminuria is apt to appear, and this may or may not be accompanied or followed by oedema. In other words, on the chronic hypertension is superimposed pre-eclamptic toxaemia. The level of blood pressure at which albuminuria appears varies considerably. The average in my last series was 160 mm. Hg systolic, but in one case the blood pressure reached 185/110 without albumin appearing. In another there was no albuminuria though the blood pressure at three antenatal visits was 160/80, 180/90, and 182/116, while in two others it was present when pressures of 134/75 and 140/90 were recorded. These figures are only rough approximations, as the blood pressure in chronic hypertension is exceedingly labile. Thus it may be recorded as 140/90 on the first occasion on which albumin is found at the weekly or fortnightly visit, but that does not necessarily mean that it was at that level when the albumin first appeared in the urine. The experiments of Chesley and Markowitz (1939) suggest that the albuminuria is caused by spasm of the afferent arterioles of the glomeruli. On immersing the hand in cold water for two minutes the blood pressure rises suddenly. If the systolic and diastolic blood pressures rose more than 16 mm. Hg albumin appeared in the urine and its onset coincided with release of the spasm. It is evidently due to the anoxia caused by the spasm injuring the glomerular capillaries. Clinical experience shows that when the blood pressure reaches 160 mm. Hg systolic, albumin usually appears in the urine. At the same time the foetus is apt to die *in utero* from concealed accidental haemorrhage. This is believed to be due to spasm of the spiral arteries of the decidua, causing anoxia and injury of the walls of the vessels distal to the constriction. When the spasm passes off and blood again floods the capillaries their walls give way. It will be recalled that Markee's (1940) observations on endometrial transplants in monkeys show that this spasm and consequent haemorrhage in the mucosa is the immediate cause and precursor of menstruation. That a similar spasm is present in women with pre-eclamptic toxaemia is well known, for it is visible in the retinal arterioles when the systolic blood pressure exceeds 150 mm.

The appearance of albumin in the urine in the patient with chronic hypertension is of very serious significance for the foetus. In my last series it developed in 14.9%. Among these the foetal and neonatal mortality was 17.8%. If the above conception of the cause of the albuminuria is correct it will be evident that the albuminuria is not itself the cause of the foetal death, nor is the death due to any toxic substance retained by the injured kidney. The albuminuria is associated with the foetal death because both are due to the same cause—that is, vascular spasm which in the kidney causes albuminuria and in the uterus causes concealed haemorrhage.

In normal pregnancy pre-eclamptic toxaemia with hypertension and albuminuria develop in only about 1% of cases In my last series of cases of chronic hypertension i developed in 14.9%, and in the first series reported wit

Miss Dodds in 1942 in 17.9%. If the view is correct that albuminuria is the result of raised blood pressure and vascular spasm, the question that has to be answered is: Why does the blood pressure tend to rise still further in such a large percentage of patients who start their pregnancy with chronic hypertension? The solution of this question would throw much light on the cause of the rise of blood pressure in pre-eclamptic toxaemia, but at present we do not know the answer.

Treatment

The Question of Terminating Pregnancy

In the more severe cases the question of terminating the pregnancy will arise. This should be done if at the beginning of pregnancy the tests of kidney function show decided deficiency or if there is well-marked retinal arteriosclerosis, exudates, or papilloedema, or persistent albuminuria. My experience shows that, even though renal function tests fail to show any definite failure to excrete or concentrate, and even though there are not any fundal changes, if before the 20th week there is persistent albuminuria it is not worth while continuing, for intrauterine death will almost certainly occur.

When in the more severe degrees of hypertension in early pregnancy there is difficulty in deciding whether the pregnancy should be continued the reaction to rest will be a valuable guide. This involves admission to hospital for a week or more, with daily records of blood pressure. If the blood pressure falls to normal or near normal levels the outlook with proper supervision is good. If, on the other hand, it remains at 150/100 or over the outlook is doubtful, and the decision as to whether the pregnancy should be allowed to continue may well rest with the woman and her husband. If it is allowed to continue very strict supervision throughout the entire pregnancy, preferably in hospital, will be necessary.

In patients in whom the results of these various tests are satisfactory the pregnancy may be allowed to continue. From the start of the pregnancy periods of rest should be enjoined, and the duration of these should increase as pregnancy progresses. Exacerbation of the hypertension is as a rule not likely to occur before the 25th week, but after that time the patient should be watched very carefully. The usual monthly visit is not enough. Even though all is going well she should be seen at least once a fortnight, and in the more severe cases once a week. Should the blood pressure rise to 150 mm. systolic she should be put to bed, preferably in hospital, and kept there for at least a week. When this is done the blood pressure usually falls to a safe level, and she may be allowed up about the ward and even out of doors. But it is rarely, if ever, safe to allow her home once this dangerous exacerbation has occurred. It is of the utmost importance to remember that the "critical level" of blood pressure is 160 mm. systolic, and that above that level albuminuria is apt to occur and the foetus to perish *in utero*. All our efforts must therefore be directed to keeping the blood pressure below this critical level, and for this purpose we have at present no better remedy than rest in bed, with a mild sedative at night such as 5–10 gr. (0.32–0.65 g.) of "carbromal." There is no need for any special diet restrictions, and a low-protein diet is unnecessary. Should pre-eclamptic toxaemia supervene with albuminuria and oedema, restriction of salt and fluid will be advisable.

In patients whose blood pressure is at a dangerously high level and does not respond to these simple measures potassium thiocyanate has been advised. I have used it in only two cases, and in neither did it seem to be of much value. In one the foetus died *in utero* at 23 weeks. The details of the other case are as follows:

Mrs. A., aged 32, had had one previous pregnancy that ended in abortion at four months. She first came under observation at 16 weeks, when her blood pressure was 198/120. Her father had died of heart disease and her mother of a stroke. Her highest blood urea was 30 mg. per 100 ml.; urea clearance, 56.45%; urea concentration, 1.25%; there was no albuminuria or any evident fundal changes. She was seen by Dr. Kenneth Harris, and under his supervision in the medical wards was treated with potassium thiocyanate. In due course, and when her pregnancy had reached 33 weeks, he wrote as follows: "Initially the B.P. showed improvement with potassium thiocyanate treatment (relief of headaches and lowering of B.P.), but now her B.P. has gone up in spite of continued drug treatment. I would recommend termination unless (*a*) her kidney function tests are all normal; (*b*) her B.P. falls appreciably in the next week." At 34 weeks retinal exudates appeared, and as the foetus was still alive caesarean section was done and a viable child obtained, which survived and is now well. It is of interest to note in passing that six months after delivery this patient's blood pressure is 210/120; there is no albumin in the urine and her fundus oculi has cleared up, so that she does not seem to be any worse.

With such simple measures as I have outlined the great majority of women with chronic hypertension go to term without any trouble and are delivered spontaneously of living healthy children. This is especially true of those whose blood pressure at the start of pregnancy is below 150/100. If, however, at any time papilloedema, with or without retinal exudates, develops, the pregnancy must be terminated at once; but if these develop late in pregnancy there is no need to sterilize unless the patient has all the children she wants or the hypertension is so pronounced that it seems unlikely that she will ever be able to bear a living child.

Method of Delivery

If there is no serious exacerbation and pre-eclamptic toxaemia does not supervene a natural delivery may be allowed at term. If a "breakdown" occurs, however, the case is different. Once albuminuria develops there is great danger of intrauterine death, and it may be advisable to terminate the pregnancy as soon as the foetus is viable. This should, if possible, be delayed until the end of the 37th week, counted from the first day of the last menstrual period. Even then it should be remembered that the foetus is often small, so that at the end of the 37th week it may not weigh more than 4 lb. (1.8 kg.), though the chances of survival seem to depend more on the degree of maturity than on weight. If therefore the pregnancy has reached the end of the 37th week there need be no hesitation in terminating it, though it is of course better to wait longer if it is possible to do so without undue risk of death *in utero*.

The really difficult cases for decision are those in which the pregnancy has reached only the 32nd or 33rd week, and where on account of uncontrollable hypertension with or without albuminuria the foetus is in daily danger of perishing. In such cases we have occasionally tried to gain a few more days by the use of "veratrone" in small repeated doses. This drug certainly lowers the blood pressure, but its action is very transient and the injections need to be repeated every three or four hours day and night, so that it hardly seems worth while, especially as supplies are limited in this country at the present time.

For the delivery of the premature infant caesarean section suggests itself as the easiest and safest method. It saves the infant from all trauma and therefore should in theory be the best method. Local anaesthesia is best, and as soon as the child is delivered its air passages should be cleared of all mucus and foreign material by a mucus extractor, if possible before it takes its first breath, for many of these infants die of inhalational pneumonia. Caesarean

section, however, is not the whole answer to the problem of delivery, and the results are not infrequently disappointing. The infant born by the natural passages seems to gain something that it loses by caesarean section. This is probably because, while respiration is inhibited by the higher centres during the last months of intrauterine life, the inhibition is slowly released by the slight asphyxia that occurs during natural labour, with the result that after birth the child breathes better than one born by caesarean section, in whom this stimulus is lacking. For this reason there is an increasing tendency at the present time to deliver more of these infants by induction of premature labour, using the rubber bougie or stomach tube so that the membranes may be intact as long as possible. It must be remembered that on account of the softness of the cranial vault and the delicacy of the cerebral vessels the premature infant is particularly apt to sustain a fatal cerebral haemorrhage during delivery. The slightest asphyxia, with resultant congestion of the cerebral veins, may lead to a haemorrhage into the lateral ventricles from the choroid plexus. A wide episiotomy so as to prevent delay of the head on the perineum and compression by the vulval ring may be a life-saving measure, and if there is delay on the perineum the application of forceps is advisable, but they must be applied laterally with the blades over the ears.

Prognosis

The Child

In our combined series the foetal loss was 9.2%. In the series recently reported by Chesley and Annitto (1947) it was 38.2%. The difference is certainly accounted for by the less rigid standard of hypertension adopted by them. The outlook for the child bears a definite relation to the height of the blood pressure at the start of pregnancy. Of the patients whose blood pressure at the start of pregnancy was 150/100 or over the foetal mortality was 63.6%. One may therefore say that, speaking generally, if the patient starts her pregnancy with a blood pressure of 150/100 or over there is only a 30% chance of her bearing a viable child. There are, however, not infrequent exceptions to this rule, and cases occasionally occur in which the blood pressure is 180 or over at the beginning of pregnancy or before it and yet the pregnancy is uneventful and successful. An example of this is Mrs. D., referred to later. One of the most puzzling questions in these cases is to distinguish at the beginning of pregnancy which patient will do badly and which well. I am not here speaking of the cases of malignant hypertension with badly involved kidney, papill-oedema, and retinal exudates, or persistent albuminuria, which always do badly and should be terminated as soon as possible, but of the case of mild or moderate degree in which there are no other abnormal signs except the hypertension itself. Why does one of these cases do badly and another do well? Why in one such case does the blood pressure rise dangerously, albumin appear in the urine, and the foetus die *in utero*, while in another apparently equally severe at the beginning of the pregnancy all goes well, the blood pressure never rises, there is no albuminuria, and a living child is born at term? It might be supposed that the two are different in nature, that the case that does badly is really an example of occult or latent chronic nephritis that lights up during the pregnancy. I do not believe that this is the explanation, for I have followed some of these patients for years. If they were examples of occult nephritis surely in the course of ten or twelve years the nephritis would have advanced sufficiently to become clinically manifest, with persistent albuminuria, yet it does not seem to do so. One example of a patient whose course I have followed for 14 years will illustrate this point.

Mrs. M. first came under our observation in 1933 when she aborted at 20 weeks. She was then aged 33 and there had been three previous pregnancies. The first had ended in eclampsia in 1927, the second and third had ended at seven months, and of these three pregnancies there had been no living child. In her fifth pregnancy she was first seen at the 12th week. Her blood pressure was 142/84; there was no albuminuria; the haemoglobin was 75.1%, the blood urea 22 mg. per 100 ml., and the urea clearance 67%. She was admitted to hospital with a diagnosis of "recurrent toxaemia," as it was believed that the underlying cause of the recurrence was chronic hypertension. She was kept in hospital until delivery. At 23 weeks the blood pressure fell to 110/75 and remained normal till the 30th week, when in spite of rest and care it began to rise until at 33 weeks it reached 168/118. Three days later albumin appeared in the urine and persisted till the end of the 36th week, when the membranes ruptured spontaneously. Caesarean section was done one week later and a living child weighing 4 lb. 4 oz. (1.9 kg.) was born; it survived, and is now 9 years old and well. After delivery the mother's blood pressure fell, and on discharge from hospital it was 126/72, but there was still a trace of albumin in the urine. Nine months later the blood pressure was 150/90 and the albumin had disappeared. In November, 1946—eight years after delivery—her blood pressure is 162/98 and *there is still no albuminuria.* The absence of albumin after all these years shows, I think, that hers is not a case of latent chronic glomerular nephritis (occult nephritis). The case of Mrs. D. (see below) lends support to this view.

In every case in which the foetus died *in utero* the blood pressure had not fallen in the second three months. On the other hand all patients in whom the blood pressure fell in the second three months gave birth to living children. This point may therefore have some prognostic value. Chesley and Annitto state that if a rise of blood pressure occurs in the second three months it is ominous for the foetus.

The Mother

Immediate Prognosis.—In the first series of 222 cases reported in 1942 by Miss Dodds and myself there were only two deaths. In the new series of 194 cases there were also two deaths, and neither could be attributed to the hypertension. One was due to ileus following caesarean section for fibroids, and another to pulmonary embolism. With exacerbation of blood pressure there is a special danger of ante-partum haemorrhage, eclampsia, and cerebral haemorrhage. In Chesley and Annitto's (1947) series of 218 patients the incidence of eclampsia was exactly ten times that in all patients, and the incidence of pre-eclamptic toxaemia was increased seven times.

Remote Prognosis.—The question at once arises: Is the woman who has chronic hypertension made any worse by pregnancy? Is her expectation of life shortened? In 1939 Gladys H. Dodds and I published the late results in 65 chronic hypertensive women who had gone through 86 pregnancies and had been followed up for periods up to twelve years. We wrote as follows: "Judged by the general condition, height of blood pressure, and cardiac changes the pregnancy did not seem to have any ill effect in 52 out of the 65 patients. In seven the effect of the pregnancy was unknown: six are dead (9.2%). . . . In spite of these six fatal cases we believe that the large majority of women with simple hypertension may pass through several pregnancies, go to term, and give birth to live infants without suffering any demonstrable deterioration in their condition." One example in illustration may be given.

Mrs. D.—This patient's first pregnancy had been terminated at 22 weeks at another hospital on account of albuminuria. She first came under our care in 1931 in her second pregnancy, when chronic hypertension was diagnosed. The highest recorded blood pressure was 164/80 and she was delivered of a macerated foetus. In the follow-up her blood pressure

four weeks after delivery was 180/110, and at five months post partum it was still 180/110, with no albuminuria. She then became pregnant for the third time, and at eight weeks her blood pressure was 164/106. Now this patient has been observed by us in five subsequent pregnancies. She has produced five living children, the last, which weighed 8½ lb. (3.85 kg.), in 1945. Eight weeks after the birth of this last child her blood pressure was 132/90 and in July, 1946—that is, one and a half years after the last child—it was 126/70. There is no albumin in the urine, the fundus oculi is normal, and kidney function tests are constantly within normal range. It is remarkable that in the first two pregnancies under our care the blood pressure remained elevated during the whole of the time. In the remaining three it fell to normal or subnormal levels in the middle months, usually but not always with a tendency to rise again towards the end of pregnancy.

I do not wish to claim that the hypertensive patient is actually benefited by pregnancy, though this case suggests that this may sometimes happen, but at least I can end the survey on a cheerful note. The experience gained by a further follow-up during and since the war confirms me in my opinion that pregnancy is not injurious provided the patient survives the immediate risks of the pregnancy itself, which are certainly somewhat greater than in the normal patient. Pregnancy does not seem to cause any permanent aggravation of the hypertension.

In 1945 Josephine Barnes and I approached the problem from another angle. We examined the blood pressures of approximately 2,000 women, half of whom were nulliparae and half had borne children. It is obvious that if pregnancy aggravated hypertension the mean blood pressures in the parous women should be significantly higher than in the nulliparae. The results classified in age groups are shown in Table I.

TABLE I.—*Showing Mean Blood Pressure in Nulliparous and Parous Women classified in Age Groups*

Age Group		Total No. of Cases	Systolic B.P.		Diastolic B.P.	
			Mean	S.D.	Mean	S.D.
16-19	N.	82	119·4	11·0	76·3	9·6
	P.	3	109·0	49·6	69·0	4·9
20-29	N.	401	119·3	15·7	76·2	11·3
	P.	208	121·8	14·1	77·4	10·8
30-39	N.	274	126·9	15·5	78·5	12·3
	P.	364	126·0	15·0	70·0	13·2
40-49	N.	105	134·9	19·3	85·0	12·1
	P.	275	134·7	22·3	85·5	13·0
Over 50	N.	53	152·7	30·9	91·6	17·0
	P.	191	155·1	30·7	93·2	16·0

N. = nulliparous. P. = parous. S.D. = standard deviation.

Table I shows that there is no significant difference between the mean blood pressures in nulliparous and parous women in any age group. It shows also that the mean blood pressure rises with age, but this applies equally to the parous and the nulliparous woman. Table II shows the same thing

TABLE II.—*Showing Percentages of Nulliparous and Parous Women with Blood Pressures over* 120/80 *and* 140/90

Age Group		Total No. of Cases	B.P. over 120/80		B.P. over 140/90	
			No.	%	No.	%
16-19	N.	82	23	28·0	0	
	P.	3	1	33·3	0	
20-29	N.	401	101	25·2	16	4·0
	P.	208	64	30·7	9	4·3
30-39	N.	274	117	42·7	23	8·4
	P.	364	133	36·6	27	7·4
40-49	N.	105	61	58·0	20	19·0
	P.	275	162	59·0	58	21·1
Over 50	N.	53	38	71·7	21	39·6
	P.	191	151	79·0	91	47·7

N. = nulliparous. P. = parous.

in a different way. Here two different standards of blood pressure are taken—120/80 and 140/90—but there is no significant difference between the numbers of nulliparous and parous women in any of the age groups. It may be remarked that these figures suggest that pre-eclamptic toxaemia and eclampsia do not of themselves *cause* chronic hypertension, or even cause a latent hypertension to appear at an earlier age than it otherwise would have done. On this optimistic note I may conclude.

Summary

Chronic hypertension constitutes about 25% of all cases of toxaemia of pregnancy.

It must be differentiated from chronic nephritis and pre-eclamptic toxaemia.

In the chronic hypertensive the blood pressure tends to fall to a normal level in the second three months of pregnancy. It may or may not rise again in the later weeks.

If the systolic blood pressure rises above 160 mm. Hg albumin is likely to appear in the urine and the foetus to die *in utero*. The reasons for these occurrences and the relation between them are discussed.

Except in the more severe cases, with signs of renal involvement, retinal arteriosclerosis, exudates, or papilloedema, there is no need to terminate pregnancy in the early weeks.

If the pregnancy is allowed to continue treatment should aim at keeping the blood pressure below the danger level of 160 mm. Hg. For this the best agent is rest—if necessary in bed.

With careful supervision most patients with chronic hypertension go to term and deliver themselves spontaneously of living infants.

In those patients in whom the pregnancy is allowed to continue the outlook for a successful pregnancy depends chiefly on the height of the blood pressure at the beginning of pregnancy. If it is over 150/100 only about 33% give birth to viable infants.

The incidence of pre-eclamptic toxaemia is about seven times, and of eclampsia ten times, that in women who are normal at the start of pregnancy.

There is no reason to believe that the hypertension is permanently aggravated by the pregnancy.

References

Barnes, Josephine, and Browne, F. J. (1945). *J. Obstet. Gynaec. Brit. Emp.*, **52**, 1, 559.
Browne, F. J. (1933). Ibid., **40**, 1160.
—— and Dodds, Gladys H. (1939). Ibid., **46**, 443.
—— —— (1942). Ibid., **49**, 1.
Chesley, L. C., and Annitto, J. E. (1947). *Amer. J. Obstet. Gynec.*, **53**, 372.
—— Markowitz, I., and Wetchler, B. B. (1939). *J. clin. Invest.*, **18**, 51.
Henry, J. S. (1936). *J. Obstet. Gynaec. Brit. Emp.*, **43**, 908.
Markee, J. E. (1940). *Contributions to Embryology*, **28**, No. 177. Carnegie Inst. of Washington Publication, Washington.
Reid, D. E., and Teel, H. M. (1939). *Amer. J. Obstet. Gynec.*, **37**, 886.
Robinson, S. C., and Brucer, M. (1939). *Arch. intern. Med.*, **64**, 409.
—— —— (1940). Ibid., **66**, 393.
Rodbard, S., and Katz, I. N. (1944). *Amer. J. Obstet. Gynec.*, **47**, 753.
Theobald, G. W. (1933). *Lancet*, **1**, 626.

Medical men thinking of starting a practice in the more remote areas of the British Empire will be interested in an article (in French) by Dr. Kalbermatten entitled "The Bush Doctor" which appeared in *Acta Tropica*, 1946, **3**, 130. The author worked for six years as a "company doctor" in the Cameroons and Belgian Congo. He precedes a general account of living conditions by a plea that employers should acquaint prospective medical officers with them more accurately than at present. He believes that, though many companies prefer to employ an unmarried man, a wife and home form a very desirable background for the medical man and help to overcome the solitude that is often his lot. He stresses the need for a good all-round education in medicine, surgery, and obstetrics as well as a knowledge of tropical diseases, since the daily rounds leave little time for reading.

FURTHER OBSERVATIONS ON THE PRODUCTION OF CANINE HYSTERIA BY FLOUR TREATED WITH NITROGEN TRICHLORIDE (AGENE PROCESS)

BY

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In an earlier paper (Mellanby, 1946) it was shown that wheaten flour, "improved" by the so-called "agene" process, which involves the treatment by NCl_3, produced, when eaten by dogs, the condition known as canine hysteria, or, in the U.S.A., as running fits; untreated flour from the same grist produced no such fits, and when it replaced treated flour in the diet the fits stopped. Reference was made to the earlier work of Wagner and Elvehjem (1944), in which, following up an unpublished observation by Parry, they showed that commercial wheat gluten produced symptoms of hysteria in dogs with great rapidity and intensity. Previously Melnick and Cowgill (1937) had produced convulsive reactions in dogs on diets of high gliadin content. It followed that, if all these observations were true, then the gluten which Wagner and Elvehjem used in their work and the gliadin of Melnick and Cowgill had almost certainly been prepared from agenized flour. As stated in the paper referred to above (Mellanby, 1946), "obviously the next test to be made in regard to canine hysteria was to compare the effects of wheat gluten made from untreated and agenized flour respectively, and this is now being done." These tests had actually been made before the 1946 paper was published, and the results expected had been obtained. A film illustrating the effect of gluten from agenized and untreated flour on the production and cure of canine hysteria was shown at the Ministry of Health on Jan. 20, at Vanderbilt University on April 1, and at the International Physiological Congress in July of this year. It seems desirable to put these facts on record, and the opportunity will also be taken of giving a brief account of one or two other observations in this field.

Action of Gluten Prepared from Agenized and Untreated Flour

In all the experiments described below the flour was agenized to the extent of 8 g. of NCl_3 to 280 lb. (127 kg.) of flour. This is an ordinary degree of treatment of flour used for human consumption.

In the earlier experiments gluten was prepared by making a dough with flour; the dough was put in muslin, and the starch washed out under cold tap-water. It was soon found that gluten made in this way from agenized flour, when added to the basal diet (see previous paper), produced typical nervous reactions, including epileptiform fits and other symptoms of canine hysteria. The amount of gluten added daily to the diet of the dogs represented about 400 g. of original flour. Under these conditions dogs developed hysteria in about four days. The same amount of gluten prepared from untreated flour of the same grist produced no such fits and, if it were allowed to replace gluten made from agenized flour in the diet of animals with canine hysteria, they recovered. Later it was found that washing the dough with warm water at a temperature of 40–45° C. had certain advantages, such as a great reduction in the time of washing out the starch and a reduction in loss of gluten sticking to the muslin. Gluten produced from untreated flour by the hot-water method, when substituted for that from agenized flour, also cured the affected animal.

It was found that the gluten contained a considerable amount of the original fat of the flour, and, as a technical method of testing whether flour has had the NCl_3 treatment is by determining the chlorine in the petrol–ether soluble portion (Kent-Jones and Herd, 1930), it seemed possible, in the early days of this work, that the toxic effect of the flour was associated with the fat fraction. Agenized flour was therefore extracted with a solution of equal parts of ether and of alcohol. After removal of the ether and alcohol the soluble concentrate was taken up as a suspension in oil and added to the diet of dogs. It was found that this fat fraction produced no hysteria but that the fat-free flour was as toxic as the original whole flour. It can therefore be deduced from this that the toxicity of the gluten was not associated with its fat content.

Having traced the toxic action of the agenized flour to the gluten fraction of the dough, an effort was then made to see whether the toxicity was associated with the gliadin or with glutelin. Gluten was prepared from treated flour and allowed to stand overnight with 65% alcohol at 37° C. It was then possible to mince the gluten into a granular mass; this was allowed to stand with 65% alcohol at a temperature of 75–80° C. under a reflex condenser for 48 hours. During this period three partial changes of the alcohol were made. After extraction the solution was centrifuged, since filtering was impossible, and the precipitate, insoluble in 65% alcohol, was regarded as predominantly glutelin, whereas the protein in the alcoholic extract was regarded as mostly gliadin. The alcohol was driven off from the gliadin fraction, and the residue was put into a pressure steamer and steamed for one and a half hours, after which it was minced and added to the diets. In the case of the glutelin fraction also the remaining alcohol was driven off and the residue treated in the same way as the gliadin before being added to the diet. The gliadin fraction produced typical hysterical outbursts when added to the diet of dogs, as did the glutelin fraction, but in the latter case the toxicity was definitely less than that of the gliadin. When the gliadin and glutelin fractions were added together to the diet the effect was similar to that produced by a corresponding amount of the original gluten, and severe hysteria and fits developed. It can probably be deduced from this experiment that the toxic substance producing canine hysteria was associated both with the alcohol-soluble (mainly gliadin) and with the alcohol-insoluble (mainly glutelin) fractions, that the gliadin fraction was more powerful in this respect than that of the glutelin, and that the chemical treatment had not destroyed any of the toxic substance. It is possible that the presence of this toxic factor in both fractions may have been due to the incomplete separation of the two proteins, but on the whole it is more probable that both proteins are involved in this chemical reaction.

Production of Hysteria in Ferrets by Agenized Flour

Reference was made in the former paper to the fact that the nervous symptoms had not been seen in rats fed on agenized flour; the same was found to be true for mice, but typical symptoms have been produced in ferrets whether fed on agenized flour itself or on gluten prepared from this flour: fat-extracted agenized flour is as potent as the flour itself, but the extracted fat has no effect. Unagenized flour from the same grists produces no abnormal symptoms, and when fed to affected ferrets the symptoms disappear. In connexion with these hysterical and other nervous outbursts produced in ferrets by this means the following points may be noted:

1. The affected animals are more drowsy than usual and tend to sleep a lot.

2. They are more vicious when handled and bite much more freely than normal animals.

3. Ferrets develop real hysteria in the sense of charging round the cages and running into the cage sides.

4. They develop true epileptiform fits when severely affected.

On the whole, however, ferrets do not appear to be quite so susceptible to these nervous abnormalities as do dogs. On the other hand, they have the advantage that experimental work can be done with much smaller quantities of the toxic agent.

Messrs. Wallace and Tiernan kindly lent the apparatus for agenizing flour on a laboratory scale. The flour used in most of the experiments reported here was treated in the laboratory, whereas that used in those described in the 1946 paper was done in the mill.

REFERENCES

Kent-Jones, D. W., and Herd, C. W. (1930). *J. Soc. chem. Ind.*, **49**, 223.
Mellanby, E. (1946). *British Medical Journal*, **2**, 885.
Melnick, D., and Cowgill, G. R. (1937). *J. Nutrit.*, **14**, 401.
Wagner, J. R., and Elvehjem, C. A. (1944). Ibid., **28**, 431.

PERFORATED PEPTIC ULCER

SHORT-TERM VARIATIONS IN FREQUENCY

BY

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In a previous paper (Illingworth, *et al.*, *Journal*, 1944, **2**, 617, 655) attention was drawn to certain seasonal, weekly, and daily variations in the frequency of perforated peptic ulcer.

The purpose of the present paper is to examine these short-term variations more fully, to enlarge the data previously given, and to add fresh observations on the influence of meal hours and of physical stress in determining the moment of perforation. The material comprises all cases of perforation treated in the three main Glasgow Hospitals (Royal, Western, and Victoria Infirmaries) during the period 1924–45. The patients are drawn from a heavily populated but geographically small area of the West of Scotland, and the majority are engaged in heavy industry.

In 1938 and again in 1943 we established that the three main hospitals treated 80% of all cases dealt with in the district, and our knowledge of local conditions convinced us that this proportion was a reasonable estimate for the whole period covered by the survey. The exclusion of the remaining 20% of perforations is not likely to be a serious cause of error for the present purpose, because there is no policy of preferential admission to the smaller institutions in certain months, on certain days, or at certain hours.

Results

Seasonal Variation.—Perforations occurring in like months were added together and the result is given in Fig. 1. It is seen that the incidence of perforation remains remarkably uniform during the spring and summer, but falls off strikingly in autumn (August, September, October), and finally reaches a high peak in December. The foci of chief interest are the transition periods July–August and October–November, together with the December peak.

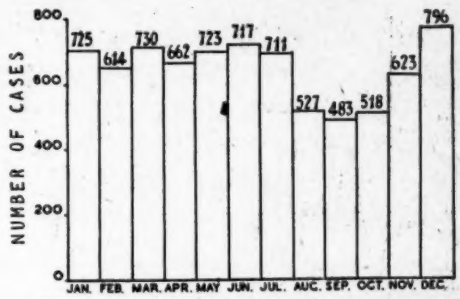
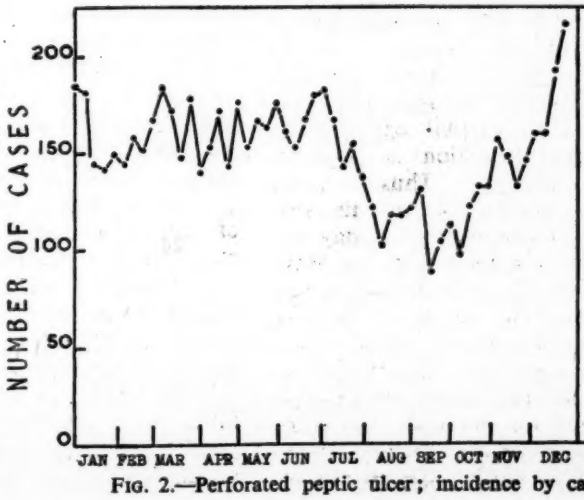


FIG. 1.—Perforated peptic ulcer; incidence by months (1924–45). The chart is adjusted to standard 30-day months; the numerals give the actual cases observed.

In order to study these periods more closely we regrouped our cases by calendar weeks (instead of by calendar months), and the result is given in Fig. 2. It will be seen that the incidence of perforation is somewhat high in the first two weeks of July and then begins to fall off to the low level of autumn: the fact that the fall begins in the second half of July is of some interest. July is the popular holiday month in the West of Scotland, and the great majority of the artisan and labouring class are on holiday during the "Glasgow Fair," which lasts for ten days during the second and third or the third and fourth weeks of July. It seems possible that the period of rest may be responsible for a degree of immunity from perforation in the ensuing months. The lowest weekly incidence of perforation has been reached by mid-September, and thereafter the incidence gradually rises till the spring and summer level has been regained by mid-December. Again, the December peak is seen to be due not to a uniformly high incidence throughout the month but to a high incidence in the later weeks: the appearance of a sudden transition to a high incidence at the middle of the month is, however, an artefact attributable to arbitrary grouping in seven-day periods.

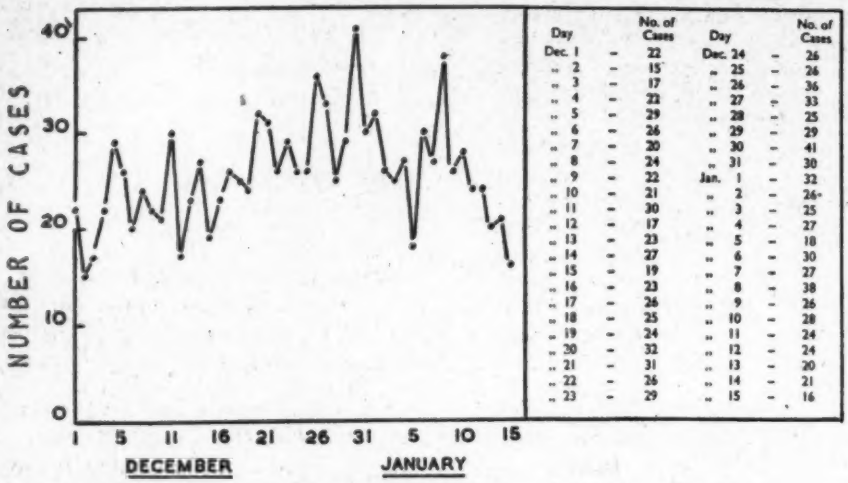
The nature of the December peak is better seen in Fig. 3, which shows the number of perforations by individual days from Dec. 1 to Jan. 15 (perforations occurring on like days throughout the 22-year period being added together). It will be seen that there are wide fluctuations from day to day, but the trend as a whole is quite clear—namely, a steady increase throughout the month.

It is worth noting that there is no special peculiarity about the number of perforations in the Christmas–New Year week, and this fact weighs against dietary or alcoholic excesses being responsible for the high incidence of per-



Week Commencing	No. of Cases	Week Commencing	No. of Cases
Jan. 1	185	July 2	182
" 8	181	" 9	166
" 15	144	" 16	142
" 22	141	" 23	155
" 29	150	" 30	138
Feb. 5	145	Aug. 6	121
" 12	159	" 13	103
" 19	151	" 20	118
" 26	168	" 27	118
Mar. 5	184	Sept. 3	121
" 12	162	" 10	132
" 19	146	" 17	89
" 26	177	" 24	105
April 2	140	Oct. 1	114
" 9	154	" 8	97
" 16	172	" 15	123
" 23	144	" 22	131
" 30	176	" 29	131
May 7	154	Nov. 5	156
" 14	166	" 12	149
" 21	164	" 19	131
" 28	176	" 26	146
June 4	162	Dec. 3	160
" 11	153	" 10	160
" 18	168	" 17	193
" 25	180	" 24	216
		Dec. 31 (alone)	30

FIG. 2.—Perforated peptic ulcer; incidence by calendar weeks (1924–45)



Day	No. of Cases	Day	No. of Cases
Dec. 1	22	Dec. 24	26
" 2	15	" 25	26
" 3	17	" 26	36
" 4	22	" 27	33
" 5	29	" 28	25
" 6	26	" 29	29
" 7	20	" 30	41
" 8	24	" 31	30
" 9	22	Jan. 1	32
" 10	21	" 2	26
" 11	30	" 3	25
" 12	17	" 4	27
" 13	23	" 5	18
" 14	27	" 6	30
" 15	19	" 7	27
" 16	23	" 8	38
" 17	26	" 9	26
" 18	25	" 10	28
" 19	24	" 11	24
" 20	32	" 12	24
" 21	31	" 13	20
" 22	26	" 14	21
" 23	29	" 15	16

FIG. 3.—Perforated peptic ulcer; incidence by single days (1924–45).

foration. Again, it is perhaps relevant to point out that in Scotland there is more merrymaking at the New Year than at Christmas, and that in the first days of January there is actually a fall in the incidence of perforation from the high level reached by the end of December. We conclude, therefore, that the December peak cannot be attributed to seasonal festivity, but we are unable to suggest an alternative explanation.

Weekly Variation.—In our previous report we showed that perforation did not occur with uniform frequency throughout the week, but that there was a deficit of perforations on Sundays and Mondays. It seemed useful to extend this observation (which was based on a sample of patients treated during the war years). We have therefore classified all our patients by the day of the week they were admitted to hospital, and perforations admitted on like days throughout the 22-year period have been added together. The result is given in Fig. 4. The suggestion that there is a deficit of perforations on Sundays and Mondays is fully borne out by this large series, and moreover it is seen that there is a fairly steady increase in perforations towards the end of the week. This finding seems to be compatible with the suggestion previously offered, that rest of the week-end might be responsible for a measure of immunity from perforation in the ensuing days.

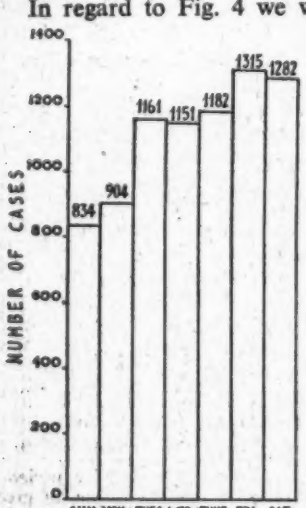
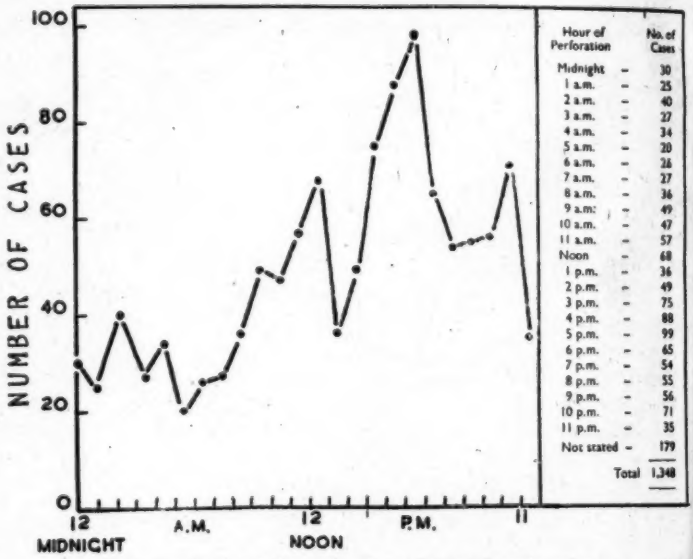


FIG. 4.—Perforated peptic ulcer; incidence by days of week.

In regard to Fig. 4 we wish to make it clear that our patients are classified according to "the day of admission" and not according to "the day of perforation." This is necessary on the ground of strict accuracy (because our data are based on the hospital registers), but the distinction is probably immaterial. Thus a small proportion of patients who perforate late on Sunday will be admitted early on Monday, some of Monday's perforations will be carried over to Tuesday's admissions, and so on, the carry-over from the day before tending to balance the carry-over to the day after. The possibility that there might be greater delay in admission at the week-end than during the week was excluded by examining a sample of patients (Western Infirmary, 1938–45): the intervals between perforation and operation were in close agreement.

Daily Variation.—Perforation does not take place with uniform frequency throughout the day, as we were able to show previously with a sample of some 900 patients. We have extended this observation to a larger series comprising all patients treated at the Western Infirmary during the period 1938–45. It is relevant at this point to state that perforation of a peptic ulcer occurs with such dramatic suddenness and is accompanied by such intense pain that there is generally little difficulty in determining the precise time of onset. Of 1,348 perforations the time of perforation was recorded in 1,169 (Fig. 5). It will be seen that perforation is rare during the night, gradually increases in frequency during the morning, reaches a peak in the middle of the afternoon,



Hour of Perforation	No. of Cases
Midnight	30
1 a.m.	25
2 a.m.	40
3 a.m.	27
4 a.m.	34
5 a.m.	20
6 a.m.	24
7 a.m.	27
8 a.m.	36
9 a.m.	49
10 a.m.	47
11 a.m.	57
Noon	68
1 p.m.	36
2 p.m.	49
3 p.m.	75
4 p.m.	88
5 p.m.	99
6 p.m.	65
7 p.m.	54
8 p.m.	55
9 p.m.	56
10 p.m.	71
11 p.m.	35
Not stated	179
Total	1,348

FIG. 5.—Perforated peptic ulcer; hour of perforation.

and again diminishes in frequency during the evening. It is noteworthy that the frequency is greatest towards the end of the working day and is lowest during the period of rest. This may be compared with the low incidence after the summer holiday period and the week-end rest.

In addition to the influence of rest on the daily variation in frequency two other factors merit inquiry: these are the influence of meal-hours and of physical stress. These factors were inquired into during the interview of 537 patients who had previously suffered perforation (Western Infirmary patients treated during the period 1938–45).

The relation of the moment of perforation to the time of the last meal is given in Fig. 6. It will be seen that perforation was most frequent between two and three hours

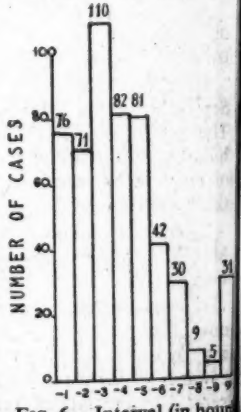


FIG. 6.—Interval (in hours) between perforation and last meal.

after a meal. Some such relationship is, however, a natural consequence of the fact that the peak incidence of perforation is in the middle of the afternoon and that the majority of patients have dinner at noon. A better idea of the relationship between perforation and the last meal is obtained by considering separately those patients who perforated (*a*) between 6 a.m. and noon, (*b*) between noon and 6 p.m., and (*c*) between 6 p.m. and midnight. These groups are represented in Fig. 7, where it will be seen that there

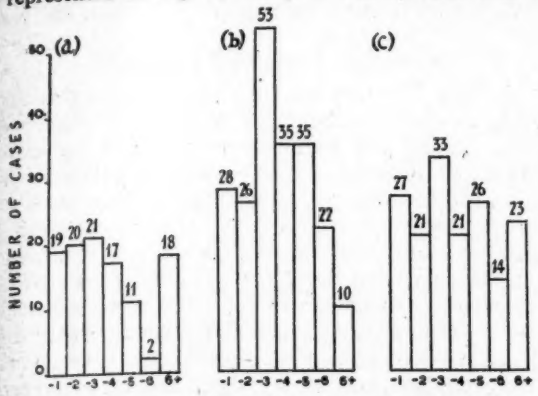


FIG. 7.—Number of hours between perforation and last meal in patients perforating between (*a*) 6 a.m. and noon; (*b*) noon and 6 p.m.; (*c*) 6 p.m. and midnight.

is no correspondence among them as regards a peak incidence related to the preceding meal. We concluded that there was no evidence to suggest that perforation occurs at any particular phase of digestion.

Finally we investigated the possibility that perforation might be precipitated by strenuous bodily exertion. We were able to ascertain what the patients were doing at the precise moment of perforation in 504 cases, thus:

No strain (364 cases):			
Standing	92	Sleeping	42
Sitting	89	Washing, shaving	16
Walking	80	Kneeling	2
Lying awake	43		
Strain doubtful or mild (98 cases):			
Stooping	27	Eating	16
Crouching	3	Drinking	16
Act of sitting	8	Turning in bed	5
Act of rising	11	Having barium meal	1
Stretching up	11		
Straining (42 cases):			
Pushing, pulling, carrying, hammering	30	Playing football	1
At stool	6	Jumping	1
Coughing	1	Leaning on stomach to ease pain	3

From the foregoing it is clear that severe exertion plays little part in precipitating perforation. Indeed, there is a strong impression, especially on reading the detailed records, that the patients were engaged in all the normal activities of daily life when the pain of perforation struck them.

Summary

Attention is drawn to the short-term variations in frequency of perforated peptic ulcer as seen in a large series of cases treated in Glasgow hospitals in the period 1924–45.

1. Perforations are relatively uncommon in August, September, and October, and unduly common in December. The beginning of the autumn fall corresponds with the local holiday period at the end of July, and may be due to the period of rest. The December peak is not due to over-indulgence at the Christmas period.

2. Perforations are relatively uncommon on Sundays and Mondays, and become more common towards the end of the week. This may be related to rest at the week-end.

3. Perforations are uncommon during the night. The frequency of perforation increases towards the end of the morning, drops in the early afternoon, and again increases notably towards the end of the afternoon. These changes may well be related to periods of rest and fatigue.

4. No evidence was found that perforation was related to the phase of digestion or occurred during strenuous bodily exertion.

SOME CLINICAL OBSERVATIONS ON THE PRESENT OUTBREAK OF ACUTE POLIOMYELITIS

BY

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When many cases of poliomyelitis are occurring, as in the present epidemic, a varied clinical picture is presented. Confusion may arise because, with emphasis on damage to the cranial nerves, other forms of meningo-encephalitis of unknown aetiology may be simulated. The percentage of bulbar cases varies in different epidemics. In the hospital of which I am medical superintendent we have been struck by the comparatively high percentage of cases showing bulbar involvement as compared with our previous experience of the disease. Had the symptoms remained entirely brain-stem, with drowsiness a marked feature and an absence of pareses or palsies of the usual asymmetrical distribution of poliomyelitis, there would have been justification for believing that intermixed with unmistakable cases of poliomyelitis were examples of a virus meningo-encephalitis, possibly in no way related in its causal agent to poliomyelitis. From a close study of some of our cases, however, there appears to be little doubt that the cases with which we are dealing, with marked meningeal and bulbar inflammation, are in fact cases of true poliomyelitis. In only a small number was there drowsiness at onset, or even during the course of the illness. Clouding of consciousness and confusion, which appeared in a few cases, amounted to no more than the delirium seen in many acute toxic illnesses. With close observation of the progress of the cases and the ultimate finding of paresis and paralysis there was little doubt that the cause of the illness was the poliomyelitis virus.

Degrees of Attack and Age Incidence

All degrees of attack are experienced, from the case in which there is only a mild transient illness, simulating other minor illnesses such as the common cold, to the most extreme forms of paralysis involving vital centres in the medulla and causing death within a few hours. The encephalitic or bulbar types may be missed in their minor form but for the occurrence of a frank case of poliomyelitis in another member of the family.

The following cases might be quoted as exemplifying variation in degree of attack:

Two cases were admitted from one family—a woman aged 31, and her child aged 4. Had the child's been an isolated case, with no known contacts, much difficulty might have been caused in diagnosis. The child, 12 days before admission, complained of headache and pain in right leg and abdomen and had vomited. On admission temperature was normal and the child was apparently well and active, but there was distinct weakness of the right facial muscles. There was no nuchal rigidity or stiffness of spine, and Kernig's sign was absent. More complete examination, however, showed weakness of the right masseter and right sternomastoid. Cerebrospinal fluid and colloidal gold reaction—no abnormality. Diagnosis was made easier by the admission on the same day of the mother with definite poliomyelitis. She had almost complete flaccid paralysis of both lower limbs and lower part of rectus abdominis. Her symptoms had begun with abdominal pain and backache three days before admission; 24 hours before admission she had

* EDITOR'S NOTE.—Dr. Kelleher, who has had special experience of poliomyelitis during the present epidemic, has, at a time of great pressure, kindly consented to write this article at very short notice in order to afford some guidance to medical men with less experience. For any incompleteness of presentation editorial exigency must be pleaded.—ED., *B.M.J.*

headache, chilliness, and weakness of legs. On day of admission headache was severe, vomiting was fairly frequent, and there was considerable pain and rigidity of posterior cervical muscles. Cerebrospinal fluid showed typical changes: increased protein and moderate increase of cells, mainly lymphocytes. The woman was in the seventh month of pregnancy.[1]

This disease should no longer be called "infantile paralysis," because frequently the adult is attacked and the attack, as in this instance, may be more severe than in the child. According to some New York statistics, whereas 40 years ago 85% of the victims were young children or infants, the proportion in more recent cases has dropped to something like 30%.

It would be wrong to deduce age incidence on the basis of the fewer than 70 cases in which poliomyelitis has been confirmed at the Western Hospital during the last two months, but it may be mentioned that 33% of the patients were under 5; 40% between 5 and 15; and 37% over 15. The disease is rare after middle age. The oldest in the present series was a man aged 41, who had a very severe form of the disease involving flaccid quadriplegia and respiratory failure. The youngest was an infant of 8 months. There have been three deaths in the series —one of them the man just mentioned; another a boy of 11, with an attack of the bulbar type and respiratory involvement; and the third an infant, with no extreme paralysis, death resulting probably not from poliomyelitis but from an intercurrent gastro-enteritis, associated at first with feeding difficulties. This child was one of twins, both bottle-fed, the other twin apparently escaping entirely.

Cranial Nerve Involvement

As an indication of the emphasis on cranial nerve involvement in the present epidemic the following instances may be given:

In a public school of mixed boys and girls there was an outbreak of illness just before the summer holidays. Many children had high temperatures and headache, some sore throat, and vomiting. One girl aged 13 complained of difficulty in swallowing and pain at back of neck. On admission she was found to have weakness of both sternomastoids and general weakness of upper extremities, but no absolute paralysis; lower limbs and trunk muscles not involved.

A boy from the same school was admitted a few days later with bulbar signs and symptoms. He had a right facial paralysis, palate affected, weak sternomastoids, and within a few days developed various other pareses and paralyses involving both upper and lower limbs.

From a residential nursery for children under 5 a nursery trainee aged 17 was admitted on a provisional diagnosis of poliomyelitis. Two days before admission she had headache and some pain at back of eyes; on day before admission she had vomited. She was found to have a slight stiff neck, temperature 100° F. (37.8° C.), persisting for less than 24 hours; no other suggestive signs. Cerebrospinal fluid showed protein within normal limits, an increase in globulin, cells, mostly lymphocytes, 23 per c.mm.

Another young girl from the same school was admitted five days later with a history of 4 days' illness, beginning with sore throat, followed by vomiting, and accompanied by pain in the back and neck and diplopia. Slight left facial paralysis noted prior to admission. Temperature, 102° F. (38.9° C.), persisted for two days. Double facial palsy rapidly developed. Slight pharyngeal symptoms on admission developed almost to complete dysfunction, with considerable collection of mucus. Muscle weakness went on to complete flaccidity of right lower limb and left upper limb, and to a lesser degree right shoulder girdle and left lower limb.

From the same institution two other trainees have been admitted with suspicious symptoms, but to date it has been impossible to confirm or exclude the possibility of very mild abortive attacks.

Considering the number of cases in which there have been cranial nerve lesions—in other words, bulbar types of poliomyelitis—it is rather remarkable that we have not had more than eight cases of involvement of respiratory function. Three cases are still being treated in respirators —an infant of 14 months, a child of 3 years, and a male adult.

Need for Systematic Examination

A detailed examination for muscle weakness should never be omitted. A group of muscles or a single muscle may be singled out by the disease. Too frequently it happens that diagnosis is made only retrospectively, the child having been allowed to walk about for a week or two after the onset of illness until a limp or drop-foot was noticed, or, being stripped for the bath, his scapula was seen to be winged owing to muscle weakness. Not only are there cases which are obvious through the manifestation of a definite paralysis, even though of minor degree, for long after the onset of the initial symptom or symptoms, but there are others with only what amounts to a weakness or paresis of a muscle group. As these weaknesses may be rapidly recovered from, they may be entirely missed unless a systematic examination is made of every case in which there is a possibility of poliomyelitis, with suggestive onset, history of contacts, possibly even signs of meningeal irritation, pointing to an acute infection involving the central nervous system.

What are the symptoms and signs which may lead to a suspicion of poliomyelitis infection, and at what stage after the infection has been contracted do they arise? Experimentally, where a virus has been transmitted to monkeys a period of from 5 to 10 days may elapse before the onset of definite paralytic disease. In the human it is difficult to be certain. Most authorities agree that the period is between 7 and 14 or possibly up to 21 days; commonly it is between 10 and 12 days.

Prodromal Illness

Initially the symptoms may in no way indicate a specific infectious disease of this nature. Those who have had the opportunity of observing large epidemics and studying family contacts have noticed an initial period of illness which may be described as prodromal or precursory, appearing within one to four days after exposure. Symptoms may be fever, general weakness, malaise, sore throat, diarrhoea, and general pains. Few practitioners in the absence of avowed cases in the neighbourhood or family would associate such a group of symptoms with the onset of poliomyelitis attack. Certain American observers[1] who have studied family and school contacts over a period after exposure and have based their diagnosis of an abortive or "sub-clinical" attack on raised temperature, state that of 22 children who had had intimate contacts with cases 14 had a febrile illness between 14 and 25 days after exposure. One of these 14 had frank poliomyelitis with transient paralysis; 2 had frank poliomyelitis without paralysis but with stiff neck, etc.; 4 had fever and mild symptoms, but without stiff neck, stiff back, or paralysis; and the other 7, although they had axillary temperatures of 98.8 to 99.8° F. (37.1–37.7° C.), seemed to have no symptoms.

Measures to be taken in such cases are the isolation of the most intimate child contacts over a period of 5 to 15 days after exposure, and the taking of temperatures daily

[1] Poliomyelitis in the pregnant woman is not uncommon. One woman admitted to a London hospital this year was almost at full-term, and rapidly developed a severe form of poliomyelitis. The child was born alive after caesarean section. The woman died of respiratory and cardiac failure.

[1] Casey *et al.* "Sub-clinical Poliomyelitis," *Amer. J. Dis. Child.*, 1946, 72, 661.

during that period. The determination of cerebrospinal fluid protein for 3 to 5 weeks after the onset of the fever is also recommended in suspected cases.

The Pre-paralytic Phase

The prodromal illness may not be noted in every case in which poliomyelitis arises in a clinical form, and the case may proceed to the stage at which frank meningeal signs and symptoms are apparent, and these may be followed by paralysis. In this pre-paralytic phase of the disease, or in what may be called, in the cases in which paralysis does not afterwards develop, the meningitic or abortive form of poliomyelitis, the symptoms are usually considerable pyrexia, headache, vomiting, irritability, pain in the posterior cervical muscles, and, not uncommonly, exaggerated tendon and skin reflexes. Except in those rare instances in which the virus attacks the cells of the cortex, or where the patient is profoundly ill as a result of the attack of the virus on the vital centres in the medulla, the patients are conscious and alert.

In the presence of suggestive symptoms one of the earliest signs of involvement of the central nervous system is nuchal rigidity. This may be elicited in the usual fashion by placing the hand under the occiput and gently attempting flexion of the head; but a proportion of cases in which a minimal degree of nuchal rigidity is present may be missed when the examination is made in that fashion, and I have found it more useful to examine for rigidity in this group of muscles by pressure over the mid-cervical region rather than on the occiput. Occasionally the patient may suffer very little pain even when considerable stretching is caused to these muscles. When asked if it hurts, children more especially may indicate that the back of the thighs or knees is the area in which pain is produced.

In the absence of definite rigidity in the cervical region the patient may be directed to sit up in bed. The degree of weakness or rigidity that may be present—and it is important to remember that spasm of the muscle may also be responsible for dysfunction—may be estimated from the difficulty in performing this act. Where the stiffness is minimal it may be elicited by asking the patient who is sitting up in bed without apparent difficulty to attempt to kiss his bent knees.

A young man admitted to hospital with suspected poliomyelitis had had some of the group of symptoms I have described above as suggestive of the pre-paralytic or meningitic phase. He was a well-developed youth, conscious and alert, and probably a little apprehensive. There was no weakness of muscle or nuchal rigidity. Kernig's sign was absent. All reflexes were markedly exaggerated. On the following day there was slight neck stiffness, Kernig's sign was positive, and the patient could no longer kiss his bent knees in the sitting posture. Twenty-four hours later he was unable to lift his head from the bed as a result of weakness of the sternomastoid muscles, both of which appeared equally affected. The right masseter muscle was also found to be weak. Weakness of the elevators at the shoulders and of the left deltoid and right triceps was later noted. When transferred to the orthopaedic hospital a few weeks later he showed considerable improvement in the affected muscles.

Rigidity of spinal muscles may be marked, and no flexion may be possible. When the patient is raised from the supine position by a hand placed between the scapulae I have noted a sign which may be of value. As he approaches the sitting position considerable tension is thrown upon the hamstring muscles, which are obviously in spasm, and to relieve tension he will flex his knees and incline them to the side. A sign of moderate spinal rigidity may be elicited when the patient, even though able to get himself into the sitting posture, cannot support himself therein and places his hands on the bed behind him—the so-called tripod position. Spasm of the muscles of the back of the thigh and knee may be shown in varying degrees by the reaction to attempts to elicit Kernig's sign.

Occasionally, even in this pre-paralytic phase of the disease, where there may be no obvious paralysis present, diminished tendon reflexes may be apparent; also there may be flushing of the skin, vasomotor disturbance, and pain and tenderness in certain muscle groups.

The Paralytic Phase

The paralytic phase of the disease may develop within a few hours of the first symptom. The central nervous system should be systematically examined, bearing in mind minor degrees of involvement. Examination of cranial nerves may reveal a slight facial paralysis, unilateral or bilateral. Nystagmus may be noted, and I have come across a few cases of diplopia in the present series; more rarely there may be a recognizable squint. A not uncommon finding has been weakness of the pharyngeal muscles, with difficulty in swallowing and, with the palate affected, difficulty in phonation, due to some extent to involvement of the orbicularis oris combined with the pharyngeal weakness. Careful watch should be kept for any difficulty in swallowing buccal secretions. Paralysis here may develop rapidly and give rise to much distress and even to partial or complete asphyxiation. Prompt recognition of this complication and its correction by removal of the products either directly or by postural drainage is of great importance. Careful search must be made for any abnormality of respiratory function.

Weakness of sternomastoids is shown not uncommonly in patients with other cranial nerve weaknesses. It may be elicited by asking the patient to turn his head to either side against the resistance of the observer's hand, when weakness may be noted or contraction of the muscle be made visible, especially on comparing one side with the other. The deltoid is one of the most commonly affected muscles. The patient may be quite unable to abduct his arm, or the weakness may be appreciated only by comparison with the other side.

In the determination of the degree of involvement of a group of muscles the suspected limb must first be placed in the neutral position and the patient's power to move the limb when supported in that position be observed. Next the patient's ability to move the limb against gravity may be tested, and finally his ability to move it against resistance from pressure. The movement of elbow and wrist, not forgetting the intrinsic muscles of the hand, should be tested. A limb should not be pronounced free from disability until comparative tests have been made on the opposing limb. A mild degree of weakness of the triceps, for example, may only be elicited by placing the patient's arm in the fully flexed position and then asking him to extend it against resistance. No examination of the upper limb is complete without a test for the power of elevation of the shoulders and for weakness of the pectoral and scapular muscles.

In the lower limb the muscles most commonly involved in paralysis or paresis are the quadriceps and the dorsiflexors of the ankle. Initial tests should be made for gross weakness and then more detailed examination for comparative disabilities. Where the movement is present in all directions it is most important, particularly when estimating the power of dorsiflexion of the foot, to estimate the degree of weakness on resisting movement with various degrees of pressure.

No examination, of course, is complete without attention to the muscles of the trunk, especially the abdominal and spinal. Retention of urine, although very common with

extreme paralysis, particularly when respiratory muscles are involved, may also be met with in cases without extensive paralysis, especially when there is involvement of the lower limbs. The finding of a distended bladder should lead to detailed examination for other signs of poliomyelitis.

The response of tendon reflexes should never be omitted in any complete examination, and valuable information may thus be obtained. The absence of reflexes, although the rule in severely paralysed limbs, does not by any means necessarily imply that serious damage has occurred or will follow. Cases are not rare in which, for example, with a paralysis of one or both upper limbs there may be diminished or absent knee or ankle jerks and yet no sign of muscle weakness in the lower limbs. After a considerable time during which no obvious alteration in power in the legs occurs these reflexes become fully responsive.

The usual tests for muscle function in infants and young children may be difficult, and one may easily be misled into believing that no weakness is present. An alteration in reflex response, either absence or diminution, especially in comparison with the opposite limb, should help to direct attention to a possible weakness which may be found after a patient examination. In infants particularly, by the use of stimuli as in stroking the sole of the foot with a pencil-point, muscle action may be seen, such as flexion of the thigh or dorsiflexion of the foot, where other tests had led one to believe that no function was present.

Pseudo-poliomyelitis

The present publicity given to this disease may lead to an occasional case in which some paralysis or paresis may be a manifestation of a hysterical condition.

A male aged 19, on short leave from the Forces, was taken ill with headache and vomiting, and complained of a weak and tired feeling in legs and feet. He also complained of backache and general pains in the limbs. On the day preceding admission he was unable to move his arms and had stiff neck. On admission, four days after onset of initial symptoms, he had a temperature of 99° F. (37.2° C.). He looked remarkably well. There was no trace of neck or back stiffness, he could sit up in bed without difficulty, but he had apparently a profound symmetrical paralysis of both lower limbs; there was no sensory loss; tendon reflexes were normal. There were strong suspicions that the paralysis was of hysterical origin. Improvement at first was slow, but became rapid when arrangements were made for his transfer to a Service hospital, a decision which he received with distaste.

A recent admission was a young man whose illness was ushered in by headache, sore throat, malaise, and, on day of admission, apparent inability to use right leg. He was found to have a marked streptococcal angina and a high temperature; no sign of nuchal rigidity; Kernig's sign absent. Dorsiflexion of right foot was weak. Tendon reflexes were normal. Pseudo-paralysis or paresis was suspected, confirmed by complete recovery of limb on following day.

A very high percentage of cases may prove to be abortive attacks. The American observers already quoted state that perhaps 98% of poliomyelitis is a mild, widespread, highly communicable disease, mainly of young children, leaving no residual paralysis, and the fatality rate is mentioned as not exceeding 0.7%.

Prophylaxis

Drugs, sera, and vaccines are of no proved value. There is still a good deal of misconception about the value of a serum, but once the virus has made biological union with the cell it cannot be dissociated by a so-called specific antibody. There is no proof that serum given to patients after onset of symptoms, even preliminary and non-neurological, will prevent the development of paralysis. It is possible that serum given to a contact directly after exposure may be preventive—that is, that the virus may be inactivated before it has reached the central nervous system, though as the vast majority of contacts escape the disease without any specific therapy it is impossible to judge the value of any method of preventing the disease among those exposed.

Prophylaxis can normally only take the form of avoidance of contacts, discouragement of crowding, avoidance of severe physical strain by contacts, care in the handling of food and its protection from flies, good chlorination of public swimming-pools, and like measures. There is undeniable evidence that recent tonsillectomy and perhaps tooth extraction increase the risk. Operations on ear, nose, and throat, and possibly, in view of the fact that the virus is present in the intestinal tract, gastro-intestinal operations, are better avoided, if this is practicable, during epidemic prevalence. An intact mucous membrane is the best barrier against the entrance of the virus. In two of the patients recently admitted to this hospital, one of whom died with a severe form of bulbar poliomyelitis, and the other had an attack involving the respiratory muscles, teeth had been extracted two or three weeks before the attack, and in another case appendicectomy had been performed 12 days before onset.

General Treatment

The three essentials of treatment are muscular rest, maintenance of good posture, and re-educational measures for muscles. The treatment of the case in hospital, apart from symptomatic treatment for pain, tenderness, and so forth, is mainly the province of the orthopaedic surgeon. Concentration of cases in a special hospital with facilities for physiotherapy is of prime importance. During the acute stage there should be avoidance of stimuli; action and movement of a limb may set up spasm and pain. Rest, physical and mental, is indicated. Sedatives may be necessary where there is much irritability and pain and tenderness. The patient should lie on a firm mattress under which should be laid a fracture board. I will not here enter upon a discussion as to the value or otherwise of rigid splinting as against the complete absence of splinting practised by the followers of Sister Elizabeth Kenny. Undoubtedly much harm can be done by too rigid splinting, and there is a good deal to be said in support of the management which includes good limb posture with avoidance of rigid splinting; also for passive movements at an early stage after disappearance of pain and tenderness, and carefully graded active exercises under adequate supervision in due course. During the acute stage the limb should be kept at rest in a neutral position, the lower limbs being so placed as to correspond to the normal erect posture, slightly flexed at the knees, and supported by small pads in that position. The management of the upper limbs depends on the degree of involvement. On the question of suitable support and posture so as to prevent movement of the limbs during the painful stage and tension on the affected muscles the opinion of the orthopaedic surgeon should, of course, be obtained. Massage is most usefully employed in cases in which muscles are completely paralysed or where no other treatment is available, but massage is no adequate substitute for passive and active exercises. Electrical treatment is of doubtful value at any stage. Where meningeal symptoms are prominent lumbar puncture may be of value.

Treatment of Respiratory Paralysis

The detection of minor degrees of respiratory involvement is sometimes very difficult. Involvement of the diaphragm may be partial, unilateral, or complete. Help in the detection of diaphragmatic weakness may be gained by immobilizing the lower ribs by lateral pressure, in which case the excursion of the epigastrium during downward

movement of the diaphragm may be more easily detected, or an inverse movement of the epigastrium—that is, a sucking in by that area during inspiration—may be noted. In cases of doubt I have found it of assistance to place the patient on his side, the abdominal wall being then in a neutral position, when it is easy to detect lesser degrees of excursion. Relative weaknesses of intercostal movement may be difficult to assess, but it should be recognized that there may be involvement of upper or of lower intercostals only or of all intercostal muscles.

Minor degrees of weakness may not require any accessory mechanical aid. When insufficient pulmonary ventilation occurs, however, respiratory treatment should be instituted, and the earlier the better if the involvement is of any degree. It is remarkable how promptly, if the respiratory treatment is going to do any good, the patient responds to it, falling asleep almost at once. A large number of respirators of the "Both" Nuffield cabinet type are distributed in the country, and this is the type of machine which is likely to be used for these cases. Patients with severe bulbar paralysis, having great respiratory difficulty, inconvenienced by collections of mucus in the pharynx, are extremely bad subjects for respirator treatment; their condition may even be worsened by putting them in respirators. But when paralysis is due to involvement of the phrenic or to a dorsal lesion, causing respectively diaphragmatic or intercostal weakness or paralysis, the respirator is of considerable value. Cases with extreme forms of respiratory paralysis of the spinal type may, of course, be kept alive for long periods in a respirator, but the end-result is often very disappointing. The intercostal muscles in particular seem prone to permanent weakness, and diaphragmatic recovery is often only partial.

The management of the patient in the respirator is a matter of careful detail into which the present space will not allow me to go. Much of it is a matter of highly skilled nursing. When there is complete respiratory failure owing to lesions in the cord the problem may arise, as it has in some of our cases, of keeping the patient alive and conscious during the brief periods when the cabinet is opened for change of bedclothes, skin treatment, catheterization, etc. Some form of accessory artificial respiration has to be provided, and for this the McKesson resuscitator is of value. It rhythmically inflates and deflates the lungs through a face mask closely applied, as in an anaesthetic apparatus, using pure oxygen or a mixture of CO_2 and O_2. The eventual weaning of the patient from the respirator may be a long and wearisome business, extending over months. When recovery is taking place he is allowed to breathe for gradually increasing periods without respirator aid, but sudden dyspnoea may occur and a rapid return to the machine may be necessary.

Statistical Summary

Of the 66 cases on which this article is based the age grouping is as follows:

Ages	Cases	Ages	Cases
0– 5	22	26–30	5
6–10	15	31–35	4
11–15	11	36–40	0
16–20	6	41–45	1
21–25	2		

Cases showing disturbance of cranial nerves, 19; nuchal rigidity, 35; inability to sit up, 16; abortive attacks, 9.

Symptoms shown after onset and before paralysis (if any): vomiting, 37; headache, 46; sore throat, 11; catarrhal conditions, 11; rigor and shivering, 7; pain in limbs, 18; backache, 17; constipation, 6 cases.

Unusual manifestations: vertigo, 4; double vision, 3; nystagmus, 3; inequality of pupils, 2; facial paralysis, mostly unilateral, 5; diaphragm affected, 9; intercostal muscles affected, 7; masseter muscle weak or paralysed, 6; sternomastoid, one or both affected, 10; paralysis or paresis of pharynx, 9; retention of urine, 8 cases.

Of 42 cases with paralysis or paresis of limb or limbs: one upper extremity only affected, 9; one lower extremity only affected, 13; upper and lower extremities affected, 8; both upper extremities affected, 6; both lower extremities affected, 6 cases.

ARTIFICIAL CIRCULATION PRODUCED BY ROCKING

ITS USE IN DROWNING AND ANAESTHETIC EMERGENCIES

BY

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Valuable lessons can be learnt from the following case of drowning treated by manual rocking. In this method the victim, instead of being rocked on a stretcher resting on a trestle, is supported face downwards on the forearms of two operators, facing each other, who tilt the body 45 degrees each way alternately. This method I have fully described and illustrated in a booklet (Eve, 1946). There I had to admit that this new method was only on trial, because it had been tested in but one case—that of a drowned child, successfully revived but inadequately observed.

Case Report

The present case was treated by Mr. A. Akrill, a highly experienced first-aider and an acute observer who has been most useful to me in working out this manual method of rocking. He tells me that, in the Beverley shipyard where he is employed, a boy of 14 fell into the swollen River Hull (temperature 45° F. (7.2° C.)) on a cold November day in 1946. He soon sank, and his body was dragged out by grapnels 15 to 20 minutes later, 100 yards downstream. Mr. Akrill, with two trained helpers, arrived in two to three minutes and at once started manual rocking. The first head-down tilt drained out water freely, but during rocking the face soon became congested and blue. Schäfer's method was therefore tried—then and for brief periods later. It stopped congestion but proved less effective than rocking for ventilation and in expelling mucus. (A curious feature was that the lower jaw was propped slightly open by the tongue but was rigid till forced open.)

After about 30 minutes of mainly rocking the face changed from cyanosis to a natural pink colour, showing that an *artificial circulation* of oxygenated blood had been created. The boy seemed warmer too, necessitating further precautions against heat-loss. Great hopes of success were thereby raised, and after 65 to 70 minutes from the start Dr. W. H. James arrived. He tells me he found the face pale but not cyanosed, the heart inaudible, the pupils widely dilated and inactive, the eyeballs flaccid, and there was no current in the distended jugulars. Hence further efforts were abandoned. The long submersion in such cold water would make recovery highly improbable. Mr. Akrill found that he could be more useful at the head end instead of at the feet—as pictured in my booklet. For there a third man could, by his two thumbs, hold the rubber hot-water bottle to the neck, wipe mucus from the nose frequently, and help rocking with his fingers under the armpits. The boy in his wet clothes would weigh about 7 st. (45 kg.); above 10 st. (63.5 kg.) a rocking stretcher would be needed, and would always be preferable. The new Akrill thigh-grip proved efficient and labour-saving, and also kept the legs straight. These new achievements may mark a mile-

stone in resuscitation. For if rocking can create a circulation in the hopelessly dead it should revive the more newly dead.

I submit that this unexplored aspect of resuscitation may be interpreted in the light of the careful experiments on drowned dogs at Toronto (1939). There the post-mortem examinations showed that the right heart and great veins were invariably engorged with blood and the left ventricle was empty. From this I infer that the final stoppage of the circulation was due to the fatal inability of the right heart to overcome the resistance of the pulmonary capillaries, perhaps increased by their spasm induced by cold. As we shall see later, rocking an adult will produce intermittently a hydrostatic pressure in the pulmonary artery double the normal 35 mm. Hg. Thus during rocking the head-down tilts would force by gravity venous blood from the trunk and legs into the lungs, congesting them further as shown by the pink frothy mucus observed in this case. In the feet-down tilts the overflow blood from the lungs would fill the empty left ventricle and pass on oxygenated to the feet and trunk ; the right heart would fill from the head and extended arms. Thus an artificial circulation, shown by pink cheeks, was in fact produced by rocking.

The Toronto investigators also found that in drowned dogs the heart ceased to beat expulsively 11 to 17 seconds after respirations stopped—with auricular-ventricular block. Then the ventricles either fibrillated (incurable), or continued to make little beats or twitches up to 20 minutes (an hour in one dog). Since the head-down tilts produce a strong pressure urging the blood through the coronary arteries it seems reasonable to hope that rocking may induce some of these limping hearts to start pumping again when their muscle is fed—besides overcoming the fatal traffic jam in the lungs. The heart may be restarted so long as it is not overdistended—beyond the limits of Starling's law. If rocking was impracticable a few brief suspensions by the heels should be very valuable. Alternatively, Dr. A. Tindal (1945) succeeded in restoring pink cheeks to a drowned boy by chest compressions combined with inversion, but it was too late for revival. Sir Leonard Hill showed in dogs that repeated total inversions could maintain circulation. It seems to me that this full range of rocking could be applied with advantage in asphyxia neonatorum. In the Toronto experiments amyl nitrite inhalations saved several dogs in late asphyxia ; no other drugs were helpful. This is a valuable hint that spasm of plain muscle, in the coronaries and perhaps in the lungs, contributes to death and that blood must be forced through them by head-down tilts aided by amyl nitrite.

Hydrostatics of the Stopped Circulation

In an adult with a stationary circulation tilted head-down at an angle of 45 degrees the head of pressure in the pulmonary artery and the aorta for the first few moments will be

$$h \times \sin 45^\circ \times \frac{\text{specific gravity of blood}}{\text{specific gravity of Hg}} \times 25.4 \text{ mm. Hg,}$$

where h is the length of the column of blood—i.e., the distance between the heels and the lung root. In a subject of height 5 ft. 10 in. (1.78 m.) this distance is 56 in. (1.42 m.), which gives a head of pressure in the pulmonary artery under the above conditions of 78 mm. Hg. In life this pressure averages only 35 mm. Hg (Samson Wright).

Hence the head-down tilts of the rocking method, each lasting four seconds, should be adequate to force blood from the aorta through the coronary circulation, to force blood through the lungs into the left heart (oxygenated), and of course to fill the right heart. The head-up tilts of three seconds each pass on the newly acquired blood, oxygenated, along the aorta and refill the right heart from the reservoir of the extended arms and head. While all blood currents are thus reversed, the valves in the heart and veins ensure that they all flow in the right direction.

If the patient is held up by the heels the above pressure is increased 43%, though this does not create a circulation. But unless quickly effective it should not be long sustained lest the congested devitalized capillaries in the lungs and head start to leak. And pressures soon diminish because the uppermost blood vessels empty.

Resuscitation in Anaesthetic Emergencies

Drowning may, I think, be regarded as a swift anaesthesia by anoxia combined with some asphyxia ; treatment of emergencies is similar in both. If breathing stops, the anaesthetist can pump oxygen into the lungs by rhythmic pressure on his rubber bag. But if the pulse stops too the heart needs much more help than this, and we have already shown how rocking can aid the circulation or create one artificially. Dr. Gordh (1945), the great Swedish anaesthetist, revives very bad cases by a 30-degrees head-down tilt (to fill the heart) and by giving oxygen. This is excellent, but it is a half-measure. It cannot maintain a circulation, and if prolonged would produce congestions: it does not renew the blood in the brain (essential) nor does it utilize the head and arms to refill the heart.

If, on the evidence now available, anaesthetists wish to avail themselves of the rocking method, the promptest service would be obtained with the 1945 model of the Riley rocking stretcher, made by Messrs. Siebe Gorman, of London, which could hang on the wall of the anaesthetic room. When lifted, the legs of this model drop and lock themselves into a trestle for instant rocking. In a few seconds it could be placed in line with the operating table. Four persons could then lift the patient his 6-ft. (1.8-m.) journey without bending him. The surgeon would guard the wound manually. Rocking could start at once, face up or down. As in boat-drill, the staff would need occasional practice. Some operating tables are made to rock but would need anti-slipping devices for safety. Ventilation of the lungs by rocking is so ample that oxygen may prove redundant and CO_2 more toxic than useful in late asphyxia ; but there is provision in the Riley rocking stretcher to give both if desired. For a stopped circulation rocking may replace the desperate remedy of cardiac massage. In operating theatres in which a technician is employed he would be in his element in adapting local resources to the practical problem of swift resuscitation by rocking—aided by hints from my booklet.

To sum up: resuscitation in severe cases demands artificial circulation as well as artificial respiration: ventilation of the lungs alone may fail even with oxygen. With a newly stopped circulation our conscious aims—though we cannot see them working—are, by prompt rocking, (1) to force the dammed-up venous blood right through the lungs ; (2) to force blood through the coronary circulation ; (3) to fill both sides of the heart. Thus the stopped heart may be coaxed to pump again and the oxygenated circulation—artificial or restored—may be in time to revive the respiratory centre.

My cordial thanks for help are due to Dr. I. S. Eve, Mr. Hamilton Bailey, and Prof. A. Hemingway.

BIBLIOGRAPHY

Eve, F. C. (1944). *J. Amer. med. Ass.*, **124**, 964.
—— (1945). *British Medical Journal*, **1**, 21.
—— (1946). *Artificial Respiration Explained*, Livingstone, Edinburgh.
Gordh, T. (1945). *Acta chir. scand.*, **92**, Supp. **102**, 1.
Hemingway, A., and Neil, E. (1944). *British Medical Journal*, **1**, 833.
Hill, L. (1895). *J. Physiol.*, **18**, 15.
Killick, E. M., and Eve, F. C. (1933). *Lancet*, **2**, 740.
Lougheed, D. W., Janes, J. M., and Hall, G. E. (1939). *Canad. med. Ass. J.*, **40**, 423.
Macintosh, R. R. (1943). *British Medical Journal*, **2**, 493.
Tindal, A. (1945). Ibid., **1**, 854.

POISONING BY INOCYBE FASTIGIATA

BY

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In this country, where the eating of fungi is much less common than on the Continent, outbreaks of poisoning due to fungi, though possibly not uncommon, are rarely reported in the papers. In 1945 three cases came under my care, all from the same household. The fungi were prepared similarly to fried mushrooms and served as a breakfast dish. They were collected by inexperienced mushroom-hunters whose criterion was based on a fallacy that the skin from the cap of the edible fungus peels readily.

Description of Cases

Case 1.—A woman aged 25 had sudden onset of blurred vision occurring about one hour after having fried fungi for breakfast. Perspiration accompanied by profuse salivation rapidly followed the first symptom. She complained of giddiness and profuse sweating. On examination, within fifteen minutes of the onset of the first symptoms, the pupils were not dilated or constricted but were equal in size and had a sluggish reaction to light. There was profuse sweating and lacrimation. The abdomen was rigid, and generalized tenderness was present. The pulse was slow (56) and irregular, the blood pressure 90/50.

Case 2.—A man aged 56 first had symptoms one and a half hours after partaking of fungi, with profuse sweating and diarrhoea. No disturbance of vision was noted by the patient. Salivation and lacrimation were profuse. On examination there was profuse sweating, salivation, and lacrimation. The pupils were equal, neither constricted nor dilated, but there was a sluggish reaction to light. The abdomen showed generalized tenderness but no rigidity. The pulse was rapid (96) and irregular and the blood pressure 132/90 owing to the presence of many extrasystoles.

Case 3.—A man aged 27 had initial symptoms of blurred vision an hour after eating fungi, followed by profuse sweating, lacrimation, and salivation. Slight nausea was noted by the patient. On examination there was profuse sweating. The pupils were equal, with a sluggish reaction to light. The heart rate was 100 and regular and the blood pressure 110/60. The abdomen showed generalized tenderness but no rigidity.

Treatment consisted in the immediate administration of 1/50 gr. (1.3 mg.) of atropine sulphate subcutaneously and gastric lavage until the fluid was returned clear, and 2 oz. (56 g.) of magnesium sulphate was left in the stomach. Within two hours all symptoms of poisoning had disappeared; convalescence was uneventful. Electrocardiograms twenty-four hours after recovery of these cases showed no abnormality beyond the presence of extrasystoles in Case 2.

Discussion

Broadly speaking, severe symptoms after partaking of poisonous fungi can be divided into two main groups: (1) Those with symptoms appearing after a period of incubation of six to twelve hours, or even longer, when the probability is that the patient has eaten *Amanita phalloides* (death cup, deadly agaric). (2) Those with onset of symptoms within one to two hours after eating fungi: the symptoms are due to muscarine, which is contained in *Amanita muscaria* (fly agaric), *Amanita pantherina*, and many species of *Inocybe*. Owing to the rapid onset of symptoms after partaking of fungi it was thought probable that these victims had eaten fungi rich in muscarine. On inquiry it was found that Case 1 had eaten far more of the fungi than either Case 2 or 3, and her symptoms were correspondingly more severe.

Muscarine (Wright, 1937) acts upon the parasympathetic-nerve endings in a similar manner to that of acetylcholine, producing profuse sweating, lacrimation, and bradycardia. These effects are abolished by atropine, which is advised as the specific antidote by Martin-Sans (1933) and Dujarric de la Rivière and Heim (1938) in the treatment of muscarine poisoning.

Similar fungi were collected from the same situation as those which had caused the symptoms, and were identified by the patients. These fungi were sent to Mr. A. A. Pearson, who identified them as *Inocybe fastigiata* (Linn.) Fr. This species of *Inocybe* is recognized by its conical straw-coloured fibrillose cap and olivaceous gills combined with the microscopical characters, which are cylindrical or clavate cells on the gill edge, and bean-shaped smooth spores. The fungus was found in a beech copse growing on chalk downs.

Previous fungus poisonings which have been brought to my notice were cases due to *I. incarnata* (Young, 1925) and *I. patouillardii*. In 1926 Prof. Wiki (Dujarric de la Rivière and Heim, 1938) divided the effects of *Inocybe* into four groups: (1) pronounced muscarine effect (*I. asterospora, I. brunnea, I. hirsuta*), (2) weak muscarine effect (*I. umbrina*), (3) unstable (*I. jurans*), and (4) without muscarine effect (*I. bongardii, I. fastigiata*).

Heim (1931) considers that *I. patouillardii* and *I. fastigiata* have muscarine effects, and this is confirmed by Henry (1931). Loup (1938) shows that *I. fastigiata* is rich in muscarine and that muscarine is stable and is able to remain active in dried specimens for several years. She also points out that Wiki admits a mistake in 1926 when he placed *I. fastigiata* in the group without muscarine effects. In a later work by Wiki and Loup (1938) they place *I. fastigiata* very high in the list of *Inocybe* containing muscarine, 0.2–0.3 g. per kg. being fatal to guinea-pigs; the figures for *I. patouillardii* are 0.2–0.25 g. per kg.

In a very interesting monograph Loup (1938) has examined the poisonous effects of thirty-three varieties of *Inocybe* which are found in Western Europe, and she comes to the conclusion that muscarine is present, in varying amounts, in twenty-two of them. All these twenty-two varieties may cause muscarine poisoning if eaten, but the severity of the symptoms depends upon the amount eaten. Of the three cases described above the most severe symptoms were present in the first, and this patient ate more of the fungi than the others; in the second case symptoms were caused after eating one small-sized fungus. From examination of these cases it is claimed that *I. fastigiata* is capable of causing severe symptoms similar to those of muscarine poisoning.

I am grateful to Mr. A. A. Pearson, of Hindhead, who not only identified the fungus but took great trouble in providing me with the correct references and much literature on this subject.

REFERENCES

Dujarric de la Rivière, R., and Heim, R. (1938). *Les Champignons Toxiques*. Paris.
Heim, R. (1931). *Le Genre Inocybe*, Paris.
Henry, R. (1931). *Thèse Méd. Lyon*. Considérations anciennes et nouvelles sur les intoxications fongiques.
Loup, C. (1938). *Contribution à l'Etude toxicologique de trente-trois Inocybes de la Région de Genève*, p. 65. Geneva.
Martin-Sans, E. (1933). *Les Empoisonnements par Champignons*, p. 14. Paris.
Wiki and Loup (1938). *Schweiz. Z. Pilzkunde*, p. 72.
Wright, Samson (1937). *Applied Physiology*, p. 162. London.
Young, T. (1925). *J. R.A.M.C.*, **44**, 52.

The American Type Culture Collection (Georgetown University School of Medicine, 3900, Reservoir Road, N.W., Washington, 7, D.C.) has issued a list of the genera represented in its collection. The publication of a full and revised catalogue will be undertaken when the sixth edition of Bergey's *Manual* appears.

Reviews

FOLIC ACID

Experiences with Folic Acid. By Tom D. Spies, M.D. (Pp. 110; 34 figures. $3.75 or 21s.) Chicago: Year Book Publishers. London: H. K. Lewis and Co. 1947.

The synthesis and clinical application of folic acid by Spies and his colleagues is the most important discovery in the field of nutrition in the last decade. Berry and Spies have already reviewed (*Blood*, 1946, **1**, 271) the biological aspects of the subject, discussing the history of the development of folic acid and its relation to other vitamins. The present monograph is a description of the clinical investigations of it. Spies tried folic acid in the macrocytic anaemias because, when testing the effect of a folic acid concentrate on the leucocyte equilibrium in malnourished persons, the general clinical improvement was so marked. Moreover, it was known that some megalocytic anaemias which resist treatment by injections of highly purified liver extracts respond to large doses of yeast or liver by mouth, that yeast and liver contain folic acid, and that most of the folic acid in liver is rejected in the process of making liver extract. Most of the patients were treated in Alabama and Havana, where sprue and nutritional macrocytic anaemia are common, and he gives details of the elaborate schedules of investigations, diet, and forms used in the examination of these patients. Over 200 people with pernicious anaemia, sprue, nutritional macrocytic anaemia, macrocytic anaemia of pregnancy, and nutritional leucopenia have been treated with folic acid and have responded satisfactorily.

A tentative hypothesis is that the anti-anaemic factors are connected in some way with nucleic acid synthesis. Folic acid may function as part of an enzyme system, which is disturbed in the various macrocytic anaemias. Liver extract may contain substances capable of liberating folic acid conjugates stored in the body, so that they can act on the cells of the bone marrow. Folic acid checks the diarrhoea of pernicious anaemia and sprue, but it does not prevent or control the neural phenomena of pernicious anaemia. It is of no value in leukaemia, aplastic anaemia, or haemolytic anaemia. This little monograph is well written and produced and beautifully illustrated. It gives a very fair account of the present status of folic acid.

L. J. WITTS.

CAUSE OF CANCER

Le Problème Biologique du Cancer. By Jacques Delarue. (Pp. 200; 31 figures. 300 francs.) Paris: Masson et Cie. 1947.

Like some other post-war French writings on cancer Delarue's book on the biological problem of cancer reveals a close acquaintance with the clinical manifestations of the disease and its morbid anatomy and histology, as well as a notable detachment from contemporary research in the English-speaking countries. Addressed to young doctors and senior students, it begins inauspiciously with a discussion on aetiology and a poor account of experimental cancer. The following chapters, which are of much higher quality, on pathological anatomy and physiology, general clinical characteristics, and choice and results of treatment, are the basis of the most distinctive feature of the book—namely, a long section on pathogenesis. Here Delarue considers many anomalies, familiar and less familiar, in the behaviour of human cancer, and discusses the limitations of the specificity of cell types, an apparently regional rather than strictly local determination of the occurrence and structure of cancers, the unexpectedly bad or good results of various forms of treatment, and the many unexplained peculiarities in the timing, localization, and extent of recurrence and metastasis. His insistence on the numerous features of tumour behaviour which orthodox pathology cannot account for is justified and timely.

Delarue proceeds, more dubiously, to reject what he calls the "cellular concept" of cancer and to substitute a rather nebulous hypothesis of his own. He regards the cellular proliferation of cancer as a reaction to metabolic disturbances in the "milieu interne." Cancer is a local manifestation of a functional disturbance of tissues, which may be regional or general; the local manifestation is determined by carcinogenic agents, which he compares somewhat vaguely with the "organizers" of embryonic development. The metabolic disturbances persist throughout the course of the disease, and inciting stimuli recur; local extension occurs by progressive transformation of normal into malignant cells; and recurrent and metastatic tumours are new growths originated *in situ* by the concurrent action of the general tissue disturbance and local inciting stimuli.

The argument, though more interesting than a brief summary may suggest, is unconvincing. It stimulates disagreement, tinged, however, with uneasiness about the extent of the field left open to speculation by ignorance of even the more mechanical details of the growth and dissemination of cancers. Students of cancer who disagree with Delarue's interpretation of obscure phenomena might profitably exercise their wits in providing an acceptable alternative.

L. FOULDS.

LABORATORY MEDICINE

Recent Advances in Clinical Pathology. By Various Authors. Produced under the auspices of the European Association of Clinical Pathologists. General Editor, S. C. Dyke, D.M., F.R.C.P. Section Editors: Bacteriology, R. Cruickshank, M.D., F.R.C.P. Biochemistry, E. N. Allott, B.M., B.Ch., F.R.C.P. Haematology and Cytology, B. L. Della Vida, M.D. Histology, A. H. T. Robb-Smith, M.D. (Pp. 468; 34 plates and 19 text figures. 25s.) London: J. and A. Churchill. 1947.

During the long war period no branch of medicine made advances more significant and numerous than did clinical pathology; moreover, for many previous years critical sifting had established the value of a number of unfamiliar methods. The younger pathologists in the Services contributed to these advances, but thousands of miles and interrupted communications separated many of them from the literature. Many of the available reference books are American and, if procurable, expensive. There is thus every need for this collection of recent work sponsored or written by acknowledged authorities, which is in a sense international, since the authors include valued guests from Central Europe. In the main it is the work of pathologists from this country—without doubt the leader in laboratory medicine.

The book, which is fully illustrated, is divided into several sections under the general editorship of S. C. Dyke; R. Cruickshank, E. N. Allott, B. L. Della Vida, and A. H. T. Robb-Smith direct the main subdivisions. Time will further sift the work presented, and some of it will not be of permanent significance. Many may think that aspiration biopsy is of less value than here suggested; some, with this reviewer, that Robb-Smith's classification of lymph-node changes seeks to classify too rigidly an organ which, by virtue of its developmental history, its wide and uncertain function, and its gross range of modification, continues to elude the pigeon-hole. However, this volume will prove to be a worthy member of the distinguished series of "Recent Advances," and no clinical pathologist should be without a copy.

R. J. V. PULVERTAFT.

TEXTBOOK OF SKIN DISEASES

Diseases of the Skin. By James H. Sequeira, M.D., F.R.C.P., F.R.C.S., John T. Ingram, M.D., F.R.C.P., and Reginald T. Brain, M.D., F.R.C.P. Fifth edition. (Pp. 782; 63 coloured plates and 380 text-figures. 63s.) London: J. and A. Churchill. 1947.

To an old-timer the fifth edition of this book revives pleasant memories of the first in 1911, from which the reviewer and his contemporaries derived so much of their early nurture in dermatology. In the revision Dr. Sequeira has been joined by Drs. J. T. Ingram and R. T. Brain, both former pupils of the London Hospital, thus assuring the continuity of design so important in a revision of this kind.

There are, as would be expected, many new additions, for dermatology progresses fast. Skin diseases rarely kill; they disable a man rather than menace his life; their effects are often economic, as in the case of industrial dermatitis—a very important matter in a community such as ours. The two chapters on industrial dermatitis and its medico-legal significance are topical because of the impending changes in the law of compensation. This is one of the new features; among others are the accounts of tropical skin diseases, on which subject Dr. Sequeira's long residence in Kenya has made him an acknow-

ledged authority. A comprehensive section on the virus infections includes accounts of herpes, vaccinia, foot-and-mouth disease, warts, and lymphopathia venerea, for, as the authors point out, many of the established facts on the nature of viruses and their aetiological significance in disease are not generally known. This is a valuable contribution. In earlier editions syphilis was given a prominent place because both in Britain and abroad it was regarded as a branch of dermatology. The modern intensive treatment, necessarily brought into use during the war, and the discovery of the specific action of penicillin may seem to have revived the ideal of a "therapia sterilisans magna." Modern intensive treatment and penicillin can undoubtedly produce remarkable immediate effects. Those who remember the introduction of "606" in 1910–11 may wonder whether history is not repeating itself, and whether we are not once more expecting too much, for if some of the treponemata are left untouched tabes, aortitis, and other late manifestations may eventually develop. On this point the authors agree that at least five years must elapse before we can judge correctly.

Reviewers sometimes have a crack at some fad or whimsy of the author's, but the writer has no disposition to exercise this supposed privilege, for there are no grounds for doing so. We should draw attention particularly to the sections on vitamins, on endocrine affections of the skin, and especially to Appendix III, where the principles of physiotherapy are discussed. In 1898 France's greatest dermatologist, Louis Brocq, published his *Traitement des Dermatoses*, in which he described the minor surgery of the skin and the use of physical agents, including x-rays. Fifty years later the practitioner can again learn in detail from a reliable source the methods of treatment by diathermy, freezing with CO_2, electrolysis, and radiations. This is an outstanding textbook.

HENRY MACCORMAC.

A STUDENTS' HANDBOOK

Diseases of the Heart and Kidney. A Handbook of Clinical Medicine. Vol. I. By J. C. Banerjea, M.B., and P. K. Chatterjee, M.B. (Pp. 184; illustrated. Rs. 8.) Calcutta: U. N. Dhur and Sons. 1947.

This book is apparently the first volume of a handbook of clinical medicine. It is difficult to judge its value, for it is intended to be only an outline of the subjects of which it treats, and it is written in a condensed and tabular style which, though apt to irritate the advanced reader, is still demanded by a certain type of student who wants his subject-matter presented in a form easy to assimilate and reproduce for the purposes of examination. Regarding it in that light we may say that on the whole the information is concise, accurate, and up to date. The book's main defect is that it teaches fact rather than principle. Written, printed, and published in India, it will be largely read by Indian students, and, since most of them work under the handicap of having to learn in a language in which they have not been accustomed to do their thinking, there is more use for this kind of textbook there than in Britain.

The fact that we do not agree with the authors' classification of nephritis must be tempered by the admission that their description is essentially that found in most current textbooks of medicine. There is of course no pretence to originality in a book of this kind, and the authors cannot be blamed for not acknowledging the sources of their information. Individual paragraphs, and indeed chapters, could be criticized more seriously, but in brief we consider that the book will fulfil a need in Indian medical schools. The production is hardly elegant, but in view of difficulties of obtaining accurate English printing in India it is commendably free from misprints.

ROBERT PLATT.

Lippincott's Quick Reference Book for Medicine and Surgery, by George E. Rehberger, has now reached a thirteenth edition (Philadelphia and London: J. B. Lippincott Co.; 90s.). Like its predecessors this edition keeps in mind the clinical problems of the general practitioner. There are 1,461 pages of text printed in double columns, and many of the illustrations are in colour. Each of the eleven sections is arranged alphabetically and the index alone occupies 42 closely printed pages. The sections on obstetrics, the skin, eye, ear, nose, and throat have been rewritten, and like the other sections they include every possible detail of history-taking, investigation, and treatment.

BOOKS RECEIVED

[*Review is not precluded by notice here of books recently received*]

Survey and Field Treatment of Malaria in Mauritius. By George Sippe, M.B., B.S., and May Twining, O.B.E., M.R.C.S., L.R.C.P., D.P.H. (Pp. 76. 25s. or Rs. 16.67.) Published on behalf of the Government of Mauritius by the Crown Agents for the Colonies. London: 1946.

An account of the distribution, effects, and treatment of malaria in Mauritius; with photographs.

A General Course in Hygiene. By A. E. Ikin, LL.D., and G. E. Oates, M.D. 3rd ed. revised by H. A. Nathan, M.R.C.S., L.R.C.P., D.P.H., M.R.San.I. (Pp. 404. 6s. 6d.) London: University Tutorial Press. 1947.

An introduction to hygiene intended primarily for medical students, sanitary inspectors, and health visitors.

Certified. By H. G. Woodley. (Pp. 224. 9s. 6d.) London: Gollancz. 1947.

An autobiography of a man confined to a mental asylum for a year.

England's Green and Pleasant Land. By J. W. Robertson-Scott. 3rd ed. (Pp. 183. 1s.) Harmondsworth, Middlesex: Penguin Books. 1947.

A collection of essays on various aspects of the countryside.

Duncan of Liverpool. By W. M. Frazer, O.B.E., M.D., M.Sc., D.P.H. (Pp. 163. 8s. 6d.) London: Hamish Hamilton. 1947.

A short biography with illustrations commemorating the centenary of the appointment of the first medical officer of health.

Nurse–Patient Relationships in Psychiatry. By Helena Willis Render, R.N. (Pp. 346. 15s.) New York and London: McGraw-Hill Book Company. 1947.

Discusses the correct approach to the psychiatric patient, special problems of nursing, and the use of art in therapy.

Pharmakologie. By K. O. Möller. (Pp. 744. 48 Swiss francs.) Basle: Benno Schwabe and Co. 1947.

A textbook of pharmacology.

The Integrative Action of the Nervous System. By Sir Charles Sherrington, O.M. (Pp. 433. 25s.) Cambridge: University Press. 1947.

This edition contains a full bibliography of the author's writings and a new preface.

Diseases of the Gallbladder and Allied Structures. By M. Behrend, M.D., F.A.C.S., F.I.C.S. (Pp. 290. $7.00.) Philadelphia: F. A. Davis Company. 1947.

A profusely illustrated account of the ball-bladder, its diseases and the treatment of them.

Diseases of the Chest. By A. R. Judd, M.A., M.D., F.A.C.S. (Pp. 608. $9.00.) Philadelphia: F. A. Davis Company. 1947.

A manual of chest diseases intended for the medical student and medical practitioner.

A Practical Textbook of Leprosy. By R. G. Cochrane, M.D., F.R.C.P., D.T.M.&H. (Pp. 283. 42s.) London: Geoffrey Cumberlege. Oxford University Press. 1947.

An account of the disease, its treatment and control, intended for the general practitioner as well as the specialist.

Heredity and Variation in Microorganisms. Cold Spring Harbor Symposia on Quantitative Biology. Vol. XI. (Pp. 314. $6.00.) Cold Spring Harbor, L.I., New York: The Biological Laboratory. 1946.

Topics discussed include induced mutation in bacteria and fungi, the study of viruses in the infected cell, and cancer causation.

If Your Child is Deaf. By Irene R. Ewing, O.B.E., M.Sc., D.C.L., and Alex W. Ewing, M.A., Ph.D. (Pp. 15. No price.) London: The Deaf Children's Society. 1947.

A pamphlet of practical advice for parents with deaf children.

The 1946 Year Book of Neurology, Psychiatry and Neurosurgery (Pp. 732. 21s.) London: H. K. Lewis. 1947.

A summary of recent advances.

BRITISH MEDICAL JOURNAL

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SATURDAY AUGUST 23 1947

THE END OF THE I.M.S.

At midnight on Thursday, Aug. 14, 1947, in common with the other great administrative Services of the Crown in India, the Indian Medical Service ceased to exist, and a period was thereby put to an association extending over 335 years, to a notable chapter of medical history, and to a Service which was unique in tradition and composition. Elsewhere in this issue (p. 309) Sir Alexander Hood pays tribute to its officers, past and present.

The Indian Medical Service had its beginnings in 1600, when there were barber-surgeons appointed to the four ships sent to the Indies by the Company of Merchant Adventurers; but it was fourteen years later, with the formation of the East India Company into a joint stock business, and with the appointment of John Woodall as its first "Chirurgion Generall," that the actual birth of the Service took place, and there began a connexion with the Company and, later, the Crown which has continued unbroken until the present month. In the earliest days these surgeons and surgeons' mates were charged with the medical care of the merchants and the staffs of the Company's factories, the ships' complements of the Company's vessels, and the native levies which were raised. Soon they established more or less flourishing practices among the surrounding Indian population. The progressive expansion of the East India Company produced a proportionate increase of these medical appointments and an increasing need for their organization, and in 1764 there were established the medical services of the three Presidencies. After a period in which these services were split into independent civil and military components the dual character of the Service was restored in 1773 and has remained inviolate, if not unassailed, ever since. In 1788 commissions were granted to its officers, and from 1858 onwards the latter have been servants of the Crown. The amalgamation of the three Presidency services into what has subsequently been known as the Indian Medical Service took place in 1896.

The expansion of British influence and territory in India involved a similar expansion of the areas depending on the I.M.S., until the Service, with a strength of some 780, found itself charged with the medical care of a sub-continent, and that at a period when medicine and surgery were rapidly advancing from dogma and empiricism to the established sciences that they are to-day. Inevitably the I.M.S. became a mirror in miniature of Western medicine in all its aspects, reflecting each change and development as it occurred, so that finally there was no major aspect of medical science unrepresented in the Service.

Primarily a military service, its officers have accompanied every expedition in which the troops of the Company and later the Crown have been engaged, including the two great wars. No fewer than five of its members have been awarded the Victoria Cross in different campaigns. During the first world war temporary commissions were granted, raising the strength of the Service from 780 to some 1,900. In the second world war the Service rose in strength from 631 to 4,147. With the creation, on the recommendation of Souttar, Bradfield, and Hood, of the Indian Army Medical Corps and the consequent, and overdue, recognition of the Indian medical licentiate, the medical officer strength of the armed forces of India rose to 7,625. It is recalled that recruitment in India remained on a voluntary basis; the distinctions gained by officers, regular and emergency commissioned alike, bear testimony to the quality of the expanded service.

On the Civil side a high sense of responsibility to the people and territories which came under their control early characterized the Service. According to D. G. Crawford, the historian of the I.M.S., the first medical school for training native doctors was established in Calcutta in 1822. Similar medical schools were begun in Bombay in 1826 and in Madras in 1827. From these sprang the Calcutta Medical College, founded in 1835, the Madras Medical College, also founded in 1835, and the Grant Medical College, Bombay, founded in 1843. Preventive medicine was formally recognized in 1867 by the appointment of the Sanitary Commissioners, subsequently the Public Health Commissioner with the Government of India, and Directors of Public Health of the Provinces. The third important landmark was the creation, in the early years of this century, of the Bacteriological Department of the Government of India, the immediate forerunner of the Medical Research Department.

In the realm of medical education officers of the Service had for a considerable time been interested in the training of Indian doctors, mainly with the object of providing themselves with more or less skilled assistants; but the idea of training an independent medical profession may be said to have originated with the foundation in 1822 of the first of the three medical schools. Since then the development of educational institutes has continued until, at the time of handing over, India has been left with ten medical colleges training students for University degrees, and seventeen medical schools for licentiate education, most of which are being rapidly raised to the status of colleges with University affiliations.

Research has gone hand in hand with medical education, and on its achievements in the promotion of knowledge of tropical diseases the fame of the Indian Medical Service must principally rest. Striking examples are the work of Timothy Lewis on trypanosomes and filaria; of Vandyke Carter on spirilla, leprosy, and mycetoma; Macnamara, Rogers, and Taylor on cholera; Joseph Fayrer, Wall, and Russell on snakes and snake venoms. Best known of all is the work of Ronald Ross, who began his investigations on the malarial parasite and its transmission while still a regimental medical officer, and whose discoveries form the basis of all subsequent advances. The discovery of the parasite of kala-azar was started by Donovan and his colleague of the R.A.M.C., Leishman, whereas that of its vector and the final proof of its transmission is the achievement of the team of workers led by Shortt. Cholera was robbed of half its terror and three-quarters of its mortality, the treatment of amoebic dysentery was established, and the treatment of leprosy was rationalized and advanced by

the work of a single officer of the Service, Leonard Rogers. Later contributions to our knowledge of malaria by Christophers, James, Sinton, and Covell are acknowledged as outstanding by malariologists everywhere. The foundations of the surgery of the prostate gland and of modern plastic surgery were laid by officers of the Service, and their contributions to ophthalmology, notably those of Smith, Elliott, Wright, and Kirwan, are matters of common knowledge. Nor must we forget McCarrison's notable researches on goitre and disorders of nutrition. These are but the more outstanding achievements of officers of the I.M.S.—many more could be cited.

It is not only in the domain of medical science that this versatile body of men achieved distinction. Providing as they did the only source from which persons with a scientific background could readily be drawn, they were appointed to and achieved distinction in many posts connected with the natural sciences. David Prayne, of the Botanical Survey of India and later Director of Kew, Alcock and Seymour Sewell, of the Zoological Survey, are names that come readily to mind, while O'Shaughnessy will be remembered as the pioneer of the electric telegraph. The scientific status of the Service has been recognized by the award to no fewer than 45 of its members of the Fellowship of the Royal Society. The Service has also provided the Crown with an envoy plenipotentiary at Teheran and with a Master of the Mint.

What of the legacy that the I.M.S. bequeathes to India and Pakistan? In the first place it has two lineal descendants—the Provincial Civil Medical Services, in most provinces highly efficient, and the young and vigorous Indian Army Medical Corps. In addition, it leaves behind a highly organized independent medical profession of some 50,000 registered medical practitioners, of which the vast majority were directly taught by officers of the Service, and the remainder by teachers who had received their own professional education from that source. The creation and development of this independent profession has been, and is, a source of legitimate pride and pleasure to the whole Service; and the professional and ethical standards set by the I.M.S. will provide its successors—in the public services and in the independent profession alike—with an inspiring tradition and a yardstick by which their success or failure will be measured. Of all the great administrative Services of India, the I.M.S. was perhaps the most fully prepared for the coming-of-age of its ward; and it can now with a clear conscience take its leave and justly claim to share with Wren the proud epitaph *Si monumentum requiris, circumspice*.

HYPERTENSION AND PREGNANCY

Prof. F. J. Browne has probably done more than anyone else in this country to focus attention on the importance of recording the blood pressure during pregnancy. He was one of the first to point out[1] that hypertension is an earlier and more constant sign of the toxaemias of late pregnancy than is albuminuria. It is now generally accepted that such conditions are characterized by a state of arteriolar spasm, and it is thought that albuminuria, when it occurs, is due to damage to the walls of the glomerular capillaries resulting from anoxia. Mussey, Hunt, and Sluder[2] have gone so far as to suggest that the term "toxaemia of pregnancy" should be given up in favour of "hypertensive disease of pregnancy." They recognize two main types—the acute, of which the examples are pre-eclampsia and eclampsia; and the chronic, represented by pre-existing hypertension or chronic nephritis, with pregnancy superimposed. Hypertension has been the subject of much clinical and experimental study in recent years, and one of the aspects which has naturally attracted attention is the effect of pregnancy on chronic hypertension. Careful surveys have been reported recently by Chesley[3,4] in the U.S.A. and by Browne and his associates in this country, and the results of the valuable work carried out by his team at University College Hospital are summarized by Browne in his William Meredith Fletcher Shaw Lecture, published in the opening pages of this issue of the *Journal*.

In spite of one or two reports to the contrary—for example, that of Golden and others[5]—it seems fairly well established that pregnancy, even if complicated by pre-eclampsia or eclampsia, does not cause chronic hypertension, nor does it permanently aggravate the condition in a woman already suffering from the disease. According to Browne chronic hypertension accounts for about 25% of the cases of toxaemia of pregnancy; Mussey,[2] giving the ten-year (1932–41) figures from the Mayo Clinic, puts the figure at 33%. It was at one time suggested that an inherited predisposition to hypertension was an important aetiological factor in pre-eclampsia and eclampsia, but this has now been refuted by statistical evidence. On the other hand, pregnancy in the presence of established hypertension involves a much greater risk of pre-eclampsia and eclampsia, the incidence being seven to ten times greater than in normal pregnant women. Browne says that 15 to 17% of women with chronic hypertension develop pre-eclampsia or eclampsia during pregnancy, but Chesley and Annitto[3] put the figure at 34%, and Mussey as high as 51%. It is not easy to compare statistics on this point, because different standards are used for the diagnosis of hypertension, and, as most writers point out, it is difficult to know when to make a diagnosis of pre-eclampsia and when to regard the patient as suffering from exacerbation of hypertension.

One of the most interesting aspects of the subject is the effect of pregnancy on the blood pressure in these cases. In about 40% the blood pressure falls during the middle third of pregnancy, but tends to rise again later. By the end of pregnancy the blood pressure rises above its pre-pregnancy level in 50 to 60% of cases, according to Browne, but in only 30% in the series reported by Chesley. The hypertension remains unaffected in a considerable proportion of cases, and in a few it is reduced throughout the whole of pregnancy, returning to its former level after delivery. It is of interest to compare these observations with those made on rats, rabbits, and dogs suffering from hypertension induced by renal ischaemia. Pregnancy in these animals, and especially in the rat, almost invariably causes a fall in blood pressure,[6,7,8] and this becomes mani-

[1] Browne, F. J. (1932). *British Medical Journal*, 1, 320.

[2] Mussey, R. D., Hunt, A. B., and Sluder, F. S. (1943). *Amer. J. Obstet. Gynec.*, 45, 224.

[3] Chesley, L. C., and Annitto, J. E. (1947). Ibid., 53, 372.

[4] —— —— and Jarvis, D. G. (1947). Ibid., 53, 851.

[5] Golden, A., Dexter, L., and Weiss, S. (1943). *Arch. intern. Med.*, 72, 301.

[6] Page, E. W., Patton, H. S., and Ogden, E. (1941). *Amer. J. Obstet. Gynec.*, 41, 53.

[7] —— (1947). Ibid., 53, 275.

[8] Dawson, J. R., Cressman, R. D., and Blalock, A. (1941). *Amer. J. Path.*, 17, 31.

fest in the first trimester and persists until delivery. Page[7 8] found that pseudo-pregnancy in rats also reduced the hypertension, but only when there was a deciduoma in the uterus. The fall in blood pressure was prevented by abortion or complete removal of the pregnancy sacs, but it continued if the foetuses were removed and the placentae were left undisturbed in the uterus. He concluded that the agent responsible for the fall in blood pressure is the placenta. It may be that the large venous sinuses in the uterus act as a low-resistance shunt, an explanation previously put forward to account for the fall in blood pressure which may be observed during mid-pregnancy, but Page favours the view that the placenta may produce some antipressor substance. He points out that, if this is so, the difference in response noted in different species might be explained by differences in placental function, differences known to exist in other respects. This work gives no support to the theory that the fall in blood pressure is caused by a compensatory effect of the normal foetal kidneys. Indeed, Page states that the fall can occur before the foetal kidneys are completely developed and functioning.

Another problem is whether the rise in blood pressure which characterizes pregnancy toxaemia has an aetiology similar to that of hypertension occurring apart from pregnancy. Studies on renal blood flow and glomerular filtration rates lead most workers to believe it to be different. Nevertheless, the facts that pregnancy so often has an effect on established hypertension, and that pre-eclampsia appears so much more commonly in hypertensive subjects, do suggest some sort of connexion. Adson and Allen[9] reported an interesting case in which a woman suffering from chronic hypertension was treated by sympathectomy with good effect. She subsequently became pregnant, and the blood pressure then rose to its former level, falling again when the pregnancy was terminated.

The association of pregnancy and chronic hypertension must always cause the clinician some anxiety, although if cases of malignant hypertension are excluded the outlook is much less gloomy than was once believed. If the woman survives the immediate risks of pregnancy it is reasonably certain that she will not suffer any permanent aggravation of her condition. During pregnancy there are the dangers of pre-eclampsia and eclampsia, ante-partum haemorrhage, cerebral haemorrhage, and post-partum collapse, but with care the great majority of women can be tided over one or even several pregnancies without ill effect. There remains the difficulty of deciding which patient will tolerate pregnancy well and which will develop one or other complication.

Browne now puts forward, as did Chesley,[3 4] certain criteria which can be regarded as indicative of a poor or favourable prognosis. Although clinical experience shows that these cannot be relied on in every case (even slight hypertension can sometimes be a forerunner to fatal concealed accidental haemorrhage), they may serve as useful general guides. Unless some reliable prognostic signs are available it means that large numbers of women must lead inactive lives and perhaps be confined to bed in hospital for many months of their pregnancy, thereby creating many domestic as well as hospital problems.

From the standpoint of both diagnosis and prognosis, blood-pressure readings must be carried out not only regularly throughout pregnancy but with far greater accuracy than is usual in crowded antenatal clinics. In some hospitals and clinics blood-pressure estimations are undertaken by inexperienced pupil midwives working with apparatus which is not always reliable. It is doubtful whether this practice is of any real value; indeed, it may only serve to give a false sense of security.

The risk to the foetus is far greater than that to the mother, and the decision when to terminate pregnancy in the interests of the foetus is always difficult. If induction of labour is delayed the foetus may die *in utero* from placental separation or infarction. If it is carried out too soon the foetus has to face the perils of prematurity and immaturity. Again Browne gives some useful indications by which the prognosis for the foetus can be assessed. He points out, moreover, a fact which is now well established but not sufficiently widely realized—that the small baby born of a mother suffering from hypertension, or indeed any type of toxaemia, is especially prone to asphyxia and injury during birth, even though the labour is rapid and easy. Special care is necessary in the delivery of these babies, and in some cases caesarean section may offer the best prospects, providing general anaesthesia is avoided. Not all are agreed that this operation gives better results; and it is not easy to be certain, because as a rule the operation is reserved for the most serious type of case, when the outlook for the foetus is inevitably poor. One point in its favour, however, is that it may avoid the onset of eclamptic fits, which are liable to be precipitated by the induction of labour in a woman with a high blood pressure.

"MUSHROOM POISONING"

Where food is concerned we are a notoriously conservative race, and poisoning by fungi may seem improbable to those of us whose gastronomic activities are governed by an unimaginative cook or, more probably, an overworked wife. Poisoning by fungi, however, does occur in this country, as evidenced by Wilson's account elsewhere in this issue (p. 297) of three cases of poisoning by *Inocybe fastigiata*. Let it be said immediately that such cases invariably occur where the fungi are eaten in mistake for mushrooms, rather than when they are chosen by an enthusiast as edible fungi—of which, according to Ramsbottom there are some 300 varieties to be found in this country. In another part of this issue (p. 304) Mr. Ramsbottom, himself an enthusiast, provides some illustrated information on the diagnosis and culinary treatment of the more common species.

Of the other fungi native to the British Isles, some, while poisonous, are so offensive to smell or taste that they are obviously inedible. Others, including many of the dangerous *Inocybe* and *Amanita* types, are virtually tasteless. Furthermore, to the inexpert eye, *Amanita phalloides* in particular and *Inocybe fastigiata* to a lesser degree bear some similarity to the common and eminently edible Field Mushroom, *Psalliota campestris*. The poisonous agent in *Inocybe fastigiata* is muscarine (which at least has given us one excellent detective story), whose action is similar to that of acetylcholine and opposed to that of atropine. The effects of muscarine poisoning are fortunately evident within one or two hours of ingestion, so steps may be taken by washouts and emetics to rid the stomach of the poison before

[9] Allen, E. V., and Adson, A. W. (1938). *Ann. intern. Med.*, **11**, 2151.

[1] Ramsbottom, J., *Nature*, 1944, **153**, 636.

a great deal of harm is done, and the physiological antidote—atropine—is, of course, specific.

Amanita phalloides does not give rise to symptoms until six to ten hours after ingestion, when the poisonous material has already left the stomach and is being absorbed by the small intestine.[2] Muscarine is found in even greater concentration in *Amanita muscaria*, *A. pantherinum*, and *Inocybe patouillardi*, while the poisonous effects of *Amanita phalloides* are shared by *A. verna* and *A. virosa*. Both muscarine and amanita toxin are resistant to heat, and in the case of *Inocybe* or *Amanita* poisoning it would appear that these poisons will remain active even after the heat of frying, which is about 140° C. The effect of amanita toxin, the only thermostable poison of the four found in *Amanita phalloides*, is comparable to that of phosphorus, and death, which occurs in approximately 40% of cases,[3] is associated with gross liver damage.

In countries where the edible fungi are more widely appreciated and more often eaten the intoxicating effects of certain of the many alkaloids produced by fungi are well known. One Siberian tribe is reported to hold agaric "parties," when large quantities of fungi of this genus are eaten in order to produce intoxication, and the urine passed by the addicts is preserved for future imbibition. These two most dangerous types of fungus, *Amanita* and *Inocybe*, tend to grow in wooded districts, where one would not normally look for the field mushroom, and they flourish on chalky soil, but both fulfil the criteria of "peeling" and neither will blacken a metal spoon. Unless, therefore, one is an expert on edible fungi it is unsafe to eat any fungus which is not very obviously a mushroom.

POLIOMYELITIS FILM

We announced last week (Aug. 16, p. 260) that the shooting of a film, "The Early Diagnosis of Acute Anterior Poliomyelitis," had begun. Now it is complete except for the captions and the sound track of the commentary. By the end of the month there should be 100 copies of this Ministry of Health film for general practitioners. Information about how to obtain copies, projectors, screens, and operators is already in the hands of all Secretaries of Divisions and Branches of the British Medical Association. The film runs for well under 20 minutes, and it clings closely to a well-prepared brief. Early diagnosis is the theme, and all the cases shown are cases that appeared in the present epidemic. The film emphasizes those clinical features described in the article by Dr. W. H. Kelleher at page 291 of this week's *Journal*.

The chart of age-incidence at the start of the film relates to this epidemic. Symptoms come next, and one of the more effective scenes shows the early restlessness of a young adult. Signs, and how to elicit them, follow. One of the features of this epidemic has been the early involvement of cranial nerves. An outstanding close-up is of a larger-than-life palate with just enough weakness on the left for it to be pulled a fraction to the right. For the last few minutes only there are some visual notes on the mode of spread, with both commentary and camera determinedly non-committal and ranging impartially from flies to faeces and from mouths to masks.

This is not a perfect film, but it achieves its objective. It will recall signs that are easily overlooked and refresh the memory of medical men who have rarely had occasion to consider children and adolescents with ill-defined symptoms as exercises in neurological examination. It has the merit, too, of being firmly related to this epidemic. The "actors" are patients and doctors.

If the film is to be of immediate practical use it should be on view as early as possible in the epidemic. Those sponsoring the film were in an obvious difficulty, because by the time medical men would have a chance of seeing it practical experience would have taught them the points the film seeks to bring out. Nevertheless this experiment in visual education was worth making, and those concerned are to be congratulated on the speed with which they have acted on the idea after it was conceived on Aug. 11. Divisions and Branches of the British Medical Association are already asking for copies and should start receiving them through the regional offices of the C.O.I. by Aug. 30.

[2] Dubash, J., and Teare, D., *British Medical Journal*, 1946, **1**, 45.
[3] Ford, W. W., in Peterson, F., Haines, W. S., and Webster, R. W., *Legal Medicine and Toxicology*, 1923, **2**, 817. Philadelphia.

PENICILLIN IN EARLY SYPHILIS

It was mentioned by Dr. Joseph E. Moore, of Baltimore, at the recent International Congress for Microbiology in Copenhagen that the number of cases of syphilis treated with penicillin in the U.S.A. and available for the analysis of the effects of this treatment has now reached 40,000. One conclusion suggested by early results and fully confirmed since is that cure is more often achieved when treatment is begun before the Wassermann reaction is positive. How far does the operation of this time factor extend? This question has been studied experimentally by H. Eagle, H. J. Magnuson, and R. Fleischman[1] in a series of rabbit therapeutic tests designed to determine the effect of three variables. Two are of secondary interest: the dose of penicillin required varied with the size of the inoculum and was greater when inoculation was intratesticular instead of intracutaneous. The operation of the time factor was studied by giving a constant dose of 2,000 spirochaetes by either of these routes, and administering penicillin in five different doses at five different time intervals, varying from four hours to six weeks. The striking fact emerging from these experiments is that a very small dose of penicillin given as a single injection in oil and beeswax suffices to abort the disease, not only when given within four hours but also when given after four days. After fourteen days a dose seven times greater is necessary, and after six weeks a dose thirty times greater to suppress the disease. Moreover, among animals treated early 65 failures included only a single rabbit with asymptomatic infection revealed by lymph node transfer, whereas this condition was common among failures from treatment after six weeks.

It is of course uncertain whether the behaviour of *T. pallidum* in the human body—and in particular its rate of multiplication in the earliest stages of infection, which the authors regard as an important factor—is comparable to that in the rabbit. If the two conditions are parallel a single dose of penicillin given within four days of exposure to infection might serve to abort the disease. This possibility is seriously discussed, and the requisite dose in man by calculation from that required in rabbits is stated as from 15,000 to 50,000 units if given within four days; about ten times this amount should suffice if given within two weeks. The truth or otherwise of the second hypothesis could perhaps be ascertained from observations on syphilis developing after the treatment of gonorrhoea with penicillin. It does at least seem possible that one dose of penicillin in oil administered shortly after exposure to infection might absolutely prevent both syphilis and gonorrhoea. If such a conclusion were accepted should the medical services of armed Forces, for instance, provide facilities for such treatment?

[1] *J. exper. Med.* 1947, **85**, 423.

SOME EDIBLE FUNGI

BY

JOHN RAMSBOTTOM, O.B.E., Dr.Sc.

Keeper of Botany, British Museum (Natural History)

On the Continent there is widespread knowledge of, and interest in, edible fungi. In France pharmacists are trained in mycological chemistry and general practitioners in the treatment of fungus poisoning; both often write their theses for a doctorate on these subjects. Since, formerly, in this country the general public was accustomed to restrict its attentions to the cultivated and field mushrooms, there was no incentive for specialized knowledge. Occasional deaths were usually dismissed as "mushroom poisoning," for the victims had invariably believed that they had eaten mushrooms, being firm in the conviction that all toadstools were deadly poisonous.

During the war, however, many people began to change their attitude towards edible fungi. There were several reasons for this, but the point may be stressed that there were no more than the usual number of accidents, like that described by Dr. Donald Wilson elsewhere in this issue (p. 297), and these were, with one exception, through eating not toadstools but what were thought to be mushrooms. The exception was a Polish Jewess at Hammersmith, who retrieved and consumed some specimens which had been rejected by her daughter. Whether with the likely spread of interest there will be carelessness, with a possible increase in accidents, remains to be seen, but medical practitioners in country towns should have the requisite acquaintance with up-to-date treatment and not rely on the "accumulated mass of clotted bosh" which has passed for knowledge.

The number of poisonous fungi is about a dozen, of which three—*Amanita phalloides*, the Death Cap, and the rare related forms *A. verna* and *A. virosa*—are deadly. Three or four others are strongly poisonous, about the same number slightly poisonous, and two or three are sufficiently indigestible to cause illness in some people. It is possible for a layman to know enough about the well-marked symptoms to be able to give a shrewd guess as to the identity of the fungus causing trouble and the probable prognosis.

There are several hundreds of toadstools that can be eaten with safety, though not all with pleasure or profit, because of unpleasant taste, leathery consistency, or small size. Three or four hundred are, however, sufficiently palatable and safe to have been used as food, and one would have no hesitation in sampling them. I have eaten, I suppose, well over a hundred different kinds with no discomfort whatever, and, apart from one or two cases of allergy, know of nothing untoward happening to any of the very many people who have accepted advice about these or other species.

Puff-balls and Fairy Rings

From the point of view of the general public, it is the sounder plan to recommend only a small number of edible species, and these the best known, the most abundant, and the most characteristic. It must be admitted that toadstools, like negroes and Mongolians, may all be said to look alike until examined closely. However, everyone knows puff-balls, and these are edible while the flesh is still white and cheesy. *Lycoperdon giganteum*, the Giant Puff-ball, can be cut in slices, dipped in egg and bread-crumbs, and fried both sides in fat; all fungi of reasonable consistency can be cooked in this way. The Common Puff-ball, *L. perlatum* (Fig. 7), cannot be confused with any fungus in any way suspect.

The Fairy Ring Champignon, *Marasmius oreades* (Fig. 6), growing in circles in lawns, though differing much in appearance according to the weather, cannot readily be mistaken. It dries easily and can be used for flavouring soups or gravies, or the caps can be cooked *à l'anglaise*—more prosaically, fried with the bacon.

The parasol mushrooms again are easily recognized. *The* Parasol Mushroom, *Lepiota procera* (Fig. 5), with its large size, scaly cap, stem scaly below a large ring, and white gills, is delicate in flavour. The Ragged Parasol, *L. rhacodes* (Fig. 3), has a smooth stem, and the flesh turns reddish when cut; change in colour is of no alimentary significance. Both can be cooked in omelettes, or the cap can be fried in butter.

Coprinus comatus, the Shaggy Ink Cap, looks like a feathered egg when young, but becomes somewhat repulsive in appearance as the cap expands and begins to shed spores, and then by autolysis converts itself to a black ink. It should be cooked young; one way is in butter *en casserole*.

The Horse Mushroom, *Psalliota arvensis*, is avoided by many, presumably because it is *not* the Field Mushroom. It is perfectly wholesome, and, though perhaps a little coarser than *P. campestris*, is often preferred. It is larger than *P. campestris*, often occurring on the edges of fields rather than in the middle; the ring on the stem is double and the gills do not become fleshy pink but smoky red. It makes a good ketchup.

Oysters and Beef Steak

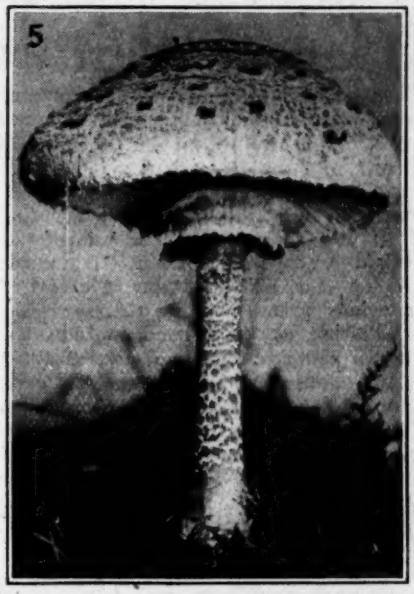
Pleurotus ostreatus (Fig. 8), the Oyster Mushroom, growing on trees, stumps, and logs, usually at first with a brownish cap which later becomes light blue or cream colour, has the shape indicated by its name.

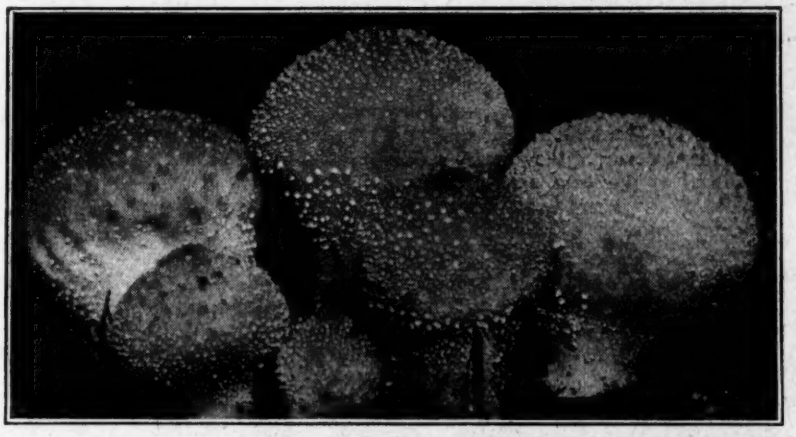
Fistulina hepatica, the Beef Steak fungus, grows usually on oaks, but its Latin name better describes its appearance.

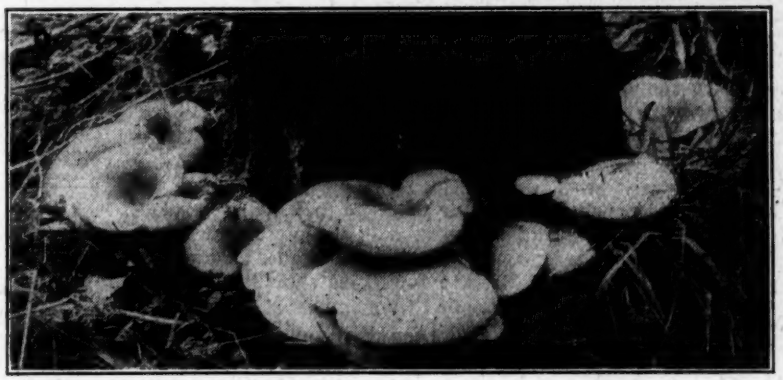
LEGENDS

FIG. 1.—*Craterellus cornucopioides*—Horn of Plenty.
FIG. 2.—*Boletus edulis*—Cep.
FIG. 3.—*Lepiota rhacodes*—Ragged Parasol Mushroom.
FIG. 4.—*Morchella esculenta*—Morel.
FIG. 5.—*Lepiota procera*—Parasol Mushroom.
FIG. 6.—*Marasmius oreades*—Fairy Ring Champignon.
FIG. 7.—*Lycoperdon perlatum*—Common Puff-ball.
FIG. 8.—*Pleurotus ostreatus*—Oyster Mushroom.

These illustrations are from the A. E. Peck collection in the British Museum (Natural History).







Chopped up with shallots and fried it provides a dish which Canadian soldiers on war service here thought most excellent.

Boletus edulis (Fig. 2), the French *cèpe*, is one of the most highly praised species. It figures largely in restaurants in France as *Cèpes à la Bordelaise, Cèpes frits, Cèpes aux tomates.* A brownish cap and a white network on the stem, together with the tubes, which are white at first, then yellow, and finally greenish, serve as distinguishing marks for this species.

The blackish-grey *Craterellus cornucopioides* (Fig. 1), Horn of Plenty, again has only to be seen to be recognized. It dries easily.

The Morel, *Morchella esculenta* (Fig. 4), has been prized since classical times. The fawn or dark-coloured honeycomb-like cap and white stem characterize this spring species. It is used dried for flavouring, or the hollow stem may be filled with a mince made of anything palatable.

Other common edible species are the egg-yellow *Cantharellus cibarius*, the Chanterelle, with vein-like gills; St. George's Mushroom, *Tricholoma gambosum*, growing in rings in spring, wholly cream-coloured; Blewits, *Tricholoma personatum*, with cream-coloured cap and gills and a purplish blue stem; Wood Blewits, *Tricholoma nudum*, wholly lilac-purplish; *Hydnum repandum*, cream-coloured and with spines in place of gills; *Sparassis crispa*, looking like a large sponge, at the base of pine trees; and *Lactarius deliciosus*, the Saffron Milk Cap, with orange-coloured milk.

From one point of view the safety of these species lies in the fact that except for the Horse Mushroom none is like the Common Mushroom, and hence is not liable to be confused with *Amanita phalloides*, though it would be well for all unable to recognize a mushroom to be content with purchase. The amount of nutriment in these fungi need not be considered here. Cooked fungi are probably more nutritious than most cooked vegetables. But whether this is accepted or not, their principal value is that they add a spice of variety to present-day diets, making them more palatable and presumably more beneficial.

MEASURES AGAINST POLIOMYELITIS

The measures to be adopted or recommended during the present epidemic of poliomyelitis were discussed at a special meeting of some eighty medical officers of health, or their representatives, from the Home Counties, at the Central Public Health Laboratory, Colindale, on Aug. 8. The meeting was also attended by medical officers of the Ministry of Health.

It was stated that at the present rate of notification there might be expected some 5,000 notified cases before the end of the year, which was far in excess of the incidence in any previous year since the disease became notifiable in 1912 (following, as was pointed out, a high incidence in 1911, also a year with a hot dry summer). About one-third of the notified cases admitted to hospital were not confirmed as poliomyelitis, and although the proportion of patients with cranial nerve involvement was probably higher than usual, severely ill cases were not very numerous. The highest incidence was in the age group 8–16 years, with about equal numbers in children below this age and in young adults. The following procedures were generally considered to be acceptable.

Preventive Measures

Swimming-baths and Paddling-pools.—Swimming-baths should not be closed unless there was some definite indication that cases had been or might be infected there. The number of children admitted on any day should be restricted and the children should be advised to stay only for a short period in the baths. It was probable that overcrowding was a more important factor than infection of the water in swimming-baths. It had been found that poliomyelitis virus was destroyed by exposure to 0.2 p.p.m. chlorine for ten minutes. Hired bathing suits and towels should be washed and laundered between use, and the floors of changing huts should be washed out and mopped with a disinfectant solution.

Fresh-water paddling-pools in areas where cases had occurred should be drained so as to discourage their use by crowds of young children, and a bacteriological check might be kept on natural bathing-pools to see that they did not become heavily polluted. There was no risk from river bathing unless a sewage effluent was entering the river near by.

Schools and Nurseries.—Schools should reopen as usual unless there were special indications to the contrary. Some attempt might be made to restrict the attendance at school of intimate contacts of cases for a period of three weeks after onset.

In regard to nursery schools and day nurseries, on the occurrence of the first case all parents should be informed, and if a second case occurred the nursery should be closed. The chances of spread of the virus among young children playing in close contact in nurseries were likely to be greater than in the ordinary schools.

Cinemas.—Cancellation of Saturday morning cinema shows for children was not generally recommended: it should not be advised unless it was quite certain that children would not go to a neighbouring cinema and so cause the overcrowding which it was desired to avoid.

Household Contacts.—The parents of children and adolescents who had been in contact with a case should be warned to keep them away from other children and young people for three weeks. If they showed any signs of illness the family doctor should be called in. Generally speaking, no action should be taken to restrict adult contacts, but those who were food-handlers should be warned to be particularly careful of personal hygiene. When a contact food-handler becomes ill an endeavour should be made to persuade him and his employer to arrange that he should not handle food for at least a fortnight.

Flies.—Although there was no evidence that flies were playing a part in the spread of infection in the present outbreak, efforts should be made to minimize the fly nuisance as a general public health measure. Salvage food bins should have tight-fitting lids and should be emptied frequently.

Fruit, Milk, and Other Foods.—Fresh fruit and milk had been suspected in the past as possible vehicles for the spread of poliomyelitis, and suitable precautions might be taken—for example, by washing fruit and peeling the skins before serving, and by pasteurizing or boiling raw milk.

Tonsillectomy, Dental Extractions, and E.N.T. Operations.—These should be avoided in areas where cases were occurring.

Press Publicity.—It was suggested that the medical officer of health should deal personally with the local Press, supplying it with such factual information as was available. The Ministry of Health had tried to guide the national Press, particularly in avoiding alarming or sensational statements.

Mode of Spread

Dr. R. Cruickshank mentioned that the virus was demonstrable in the oropharynx of 30–50% of cases for some days before and after the onset of typical symptoms, and it persisted in the stools of half the cases for three to four weeks after onset. Although the present tendency in America, as indicated by Sabin (*J. Amer. med. Ass.*, 1947, **134**, 749), was to stress the intestinal mode of spread, epidemiological evidence suggested that the respiratory route was perhaps more common and that patients might be infectious in the prodromal stage. He asked his colleagues to record particularly any history of nasopharyngitis at this early stage. The great rarity of infection among those nursing paralytic poliomyelitis despite the presence of virus in the faeces was in contrast to the findings in typhoid and dysentery. Respiratory infections might spread in high summer, as witness the present prevalence of measles.

Infected dust might be a factor, although outbreaks in the U.S.A. had occurred in wet as well as in dry seasons. Another epidemiological feature of poliomyelitis was that outbreaks did not recur in the same area in consecutive years, which suggested a widespread latent immunization with the virus.

Clinical Features

Dr. W. H. Kelleher described some of the clinical features of the cases admitted to the L.C.C. Western Hospital. Only one-quarter of the cases were under 5 years of age, the others ranging up to 32 years. As an example of the protean nature of the disease, of 3 adolescent girls who had been admitted from the same institution, one had no paralytic symptoms but showed some meningeal irritation and changes in the cerebrospinal fluid, the second had polio-encephalitis with late peripheral paralysis, while the third had only one group of muscles affected. Lumbar puncture might be a useful diagnostic aid in doubtful or abortive cases. It was suggested that cases of poliomyelitis should be brought together under expert nursing and medical care, since the handling of bulbar cases particularly needed experienced staff. Attention was drawn to the possible occurrence of anoxaemia from bulbar paralysis simulating encephalitis (*J. Amer. med. Ass.*, 1947, **134**, 767). There was no shortage of "iron lungs." Any medical officer requiring one in a hurry should get in touch with the London Emergency Bed Service. Respirators not in use should be overhauled and made serviceable. There should be a close liaison between physician and orthopaedic surgeon so that paralysed cases could have remedial treatment as early as possible. The Supply Divisions of the Ministry of Health had been asked to make available through their regional organizations a supply of bed cradles, possibly to be lent out for use by patients in their own homes.

Dr. F. O. MacCallum, Virus Reference Laboratory, Colindale, said he had been receiving brain and cord tissue in 50% glycerol saline from different parts of the country. He was also collecting samples of serum from acute and convalescent cases for assay of the neutralizing antibody against the Lansing strain which had been adapted to rodents. He wished to discourage the sending of further specimens of cerebrospinal fluid, faeces, or urine, except by special arrangement.

The 8th (London) Field Hygiene Company, R.A.M.C. (T.A.), has vacancies for non-medical hygiene officers, N.C.O.s, and other ranks. The commanding officer would appreciate it if medical officers of health would draw the attention of members of their staffs to the existence of this unit. Sanitary inspectors would be particularly suitable for appointments in it. Full particulars may be obtained from the officer commanding the unit, at Duke of York's Headquarters, Chelsea, London, S.W.3.

Reports of Societies

TREATMENT OF SYPHILIS

The Medical Society of the L.C.C. Service held a meeting at Horton Hospital, Epsom, on July 2, to discuss the modern treatment of syphilis.

Dr. W. N. MASCALL said that there was at present no standard treatment of early syphilis; the dosage of penicillin appeared to vary between 2½ and 16 million units; in some cases this was supported by arsenic and bismuth, and in others it was not. He still preferred the seven-and-a-half-day course of 2,400,000 units by divided dosage, but if the patient could not stay in hospital he gave one daily injection of 500,000 units in ethyl oleate for ten days. Following either of these courses, ten weekly injections of neo-arsphenamine 0.6 g. and bismuth oxychloride 0.4 g. were given. Further treatment depended on the serological changes in the blood and cerebrospinal fluid.

Mr. A. J. KING opened the discussion on the treatment of late syphilis, excluding neurosyphilis and cardiovascular syphilis. Such cases were of two types—those with gummata and those termed "late latent syphilis," in which the diagnosis was based on positive serum reactions. The aims of treatment were to heal lesions, to render the patient non-infectious, and to prevent the development of fresh lesions. "Cure" in the sense of eliminating the last infecting organism was not a primary aim as it was in the treatment of early syphilis. Reversal of positive blood serum reactions was not an aim of treatment, for it had little or no bearing on ultimate prognosis. Given adequate treatment the "Wassermann-fast" patient had as much chance of remaining permanently free from the effects of syphilis as the patient whose serum test promptly became negative. In starting treatment the ground should be prepared by slow-acting remedies such as insoluble bismuth 0.2 g. intramuscularly once weekly, and potassium iodide by mouth 5 gr. (0.32 g.) three times a day, increasing to the limit of tolerance, or to the maximum of 90 gr. (6 g.) a day. After a month of this treatment more active remedies could be used. Penicillin produced rapid healing of gummata, but was no more effective than other remedies in reversing fixed positive serum tests. Its use in late latent syphilis was based on its known action in symptomatic syphilis, early or late. It should be supported by other drugs which had been shown to give a very high rate of protection when used in adequate dosage.

Little was to be gained by increasing the dosage of penicillin above 2.4 million units. This might be given as 60 injections, each of 40,000 units every three hours, day and night, for seven and a half days, or as 150,000 units of calcium penicillin in oil-wax mixture twice daily for eight days. Subject to age, tolerance, and general condition this should be followed by a minimum of two and a maximum of three full courses of neoarsphenamine and bismuth, each course lasting ten weeks, and with a four-week interval between courses. The maximum suggested dosage of neoarsphenamine in each course was 5.85 g., and of bismuth 4 g. After this, all treatment should be stopped irrespective of the results of serum reactions. If the patient was a woman and later became pregnant, further treatment would be necessary.

Neurosyphilis

Dr. W. D. NICOL described the treatment of neurosyphilis. A complete examination of the cerebrospinal fluid was essential and should include a cell count, the total protein estimation, the colloidal gold test, and the Wassermann reaction. The great majority of fluids were completely negative within three years. When there had been at least two consecutive negative results it was safe to assume that any subsequent relapse was most unlikely.

For the active case of general paralysis of the insane decidedly better clinical and serological results were obtained in cases treated with both malaria and tryparsamide than in those treated with malaria alone. Tryparsamide had several disadvantages, particularly with regard to ocular complications. Penicillin was now being used as a routine either in combination with malaria or alone. For the more advanced case of general paralysis penicillin was of great value in that it frequently improved the general physical condition and so enabled the patient to have a subsequent course of malaria. A striking feature of penicillin therapy which had been observed was the clinical improvement during a course of penicillin, which was rarely, if ever, seen during malaria therapy.

Dr. M. WHELEN said that in malaria therapy the important factor was the height of the fever and not the rigor. No rise of temperature below 103° F. (39.4° C.) was of real therapeutic value. At the Horton Centre the temperature was recorded every quarter of an hour so long as it was raised.

CONFERENCE ON INFERTILITY

A Conference on Infertility, arranged by the Family Planning Association (which incorporates the National Birth Control Association) was held at the Nuffield Institute for Medical Research, Oxford, on July 26 and 27.

Experiences of a Fertility Clinic

Dr. G. WYNN-WILLIAMS, who deputized for Dr. P. M. F. Bishop, gave an account of the experiences of the last two years in the fertility clinic attached to the Chelsea Women's Hospital. He said that of 372 couples questioned on the subject, 271 showed that they had no knowledge whatever of the fertility phase. Of the remainder who said that they had this knowledge, a number had only recently been told. Husbands seemed very diffident about coming to the clinic. Out of 253 who came, 53% showed apparently normal spermatogenesis; 23% showed a mildly defective spermatogenesis; 17% were grossly defective, and 7% had aspermia. It was insisted that the husbands produced by masturbation three specimens for examination. Other methods were not satisfactory. Sometimes the first sample might show gross defect, and the next might be normal, but generally the same pattern obtained in all three specimens.

Every patient was examined by insufflation and salpingography. The double procedure might be questioned, but they saw no reason for discontinuing it. Insufflation was done in the third week, from the 14th to about the 18th day. Both procedures were undertaken under anaesthesia. Air was generally used for insufflation; carbon dioxide occasionally. There were arguments against the use of air, but so far no untoward results had occurred. The salpingograms were obtained with the use of lipiodol, largely because none of the new radio-opaque substances which were being used in America could be obtained. In 224 double insufflations carried out during two years the tubes were found to be completely blocked in 36 cases. Of the patients insufflated, 11 became pregnant within two months after insufflation. There had been one or two cases of intravasation of uterine and ovarian veins following the making of salpingograms, but up to the present there had been no untoward results beyond a slight discomfort for twenty-four hours. The patients attending the fertility clinic were asked to keep a record of their morning temperatures. The temperature was taken by mouth, which was perfectly satisfactory, provided the patient took it before rising.

So far they had not been very successful in causing the patient who did not ovulate to do so. They were disappointed in the results with the woman with the non-ovulatory cycle. Every patient had a post-coital test, and out of a total of 117 cases a repeatedly negative post-coital test was found only in 10, with single negatives in 10 others. It was a valuable test in the investigation of these cases.

Dr. R. J. IRVING-BELL said that at the clinic in Bristol he dealt entirely with the men, and a woman doctor took the women's clinic. He had always found the husbands eager to be examined. Out of 250 couples the husband failed to turn up in only one case. Of the husbands referred to the clinic last year, 57% were referred from the female clinic, 22% from general practitioners, who realized that this was a useful service, about 9% from the marriage guidance clinic, and 9% came on the initiative of the husband himself. In 40% of cases the women had become pregnant following the advice given at the clinic, mainly as to the fertile period. He praised the use of methyl testosterone. When a small amount was given over a

period of six weeks a low sperm count rose to normal again and motility also became normal. It was a rule at his clinic never to carry out an investigation on a female, other than clinical examination, until the husband had been examined and the semen analysed. It was not fair to the wife to compel her to go through these manœuvres when in about 50% of cases the infertility was to be attributed to the husband.

Dr. RAYMOND GREENE said that with regard to temperature records his impression was that in a large number of patients, which might very well be the proportion of endocrinologically normal women, the oral temperature showed quite distinctly the time at which ovulation occurred. Dr. G. MACLEOD, of New York, said that American experience was that there was no difficulty at all in getting the husbands to the clinic. Dr. R. G. CROSS, of Dublin, thought that anybody who used lipiodol was "guilty of a criminal offence." There had been one death due to lipiodol in his experience, though not in his practice. There was no justification for exposing a woman to such a procedure. Dr. WYNN-WILLIAMS said that so far, at Chelsea, there had been no catastrophes with lipiodol.

The Spastic Uterus

The spastic uterus was the subject of an address by Mr. JOHN STALLWORTHY, of Oxford. He said that he first became interested in this aspect of non-fertility fifteen years ago. It was difficult to see what reason there was for women normally married, with no history of ill-health, having tubes which were not patent, and he had tried to keep an open mind on the subject of tubal occlusion. Some published figures gave a proportion of something like 5% of spastic tubes in all cases examined, and this phenomenon of spasticity seemed as if it might furnish a clue. In his clinic much attention was paid to the radiological screening of patients as contrasted with the film. He had often pointed out that the radiograph might give quite a misleading appearance, whereas observation of the screen would reveal the true condition. In many patients the uterus on screening was observed to behave in a strange manner. The uterus showed spasm and irritability far more often than had been previously recognized. It was also shown on the *x*-ray screen that the common belief in the effect of atropine and anaesthesia was misplaced; in fact, anaesthesia itself would very quickly precipitate spasm. At present nitroglycerin was being used as an antispasmodic. In analysing 1,000 clinic cases the tubal occlusion rate was found to be 21%, but on becoming more interested in the subject of spasm and after using nitroglycerin there was a dramatic change in the picture and a re-examination of many of these people gave a corrected rate for the series of 12.8%. Going back over the last 171 cases, the rate up to date was 9%. It seemed possible that many women were suffering from a persistent spastic tendency, in the light of which the customary figures for tubal occlusion given by various workers seemed to need modification. He added that the recent tendency to become "hormone-minded" caused the action of the autonomic nervous system often to be forgotten. That system could act with great suddenness, and women who, like their husbands, were fertile and wanted a baby might find that because of their fears or desires their uterine function was so disorganized that they could not conceive.

Factors in Habitual Abortion

Mr. LINTON SNAITH, of Newcastle-upon-Tyne, discussed some factors in habitual abortion. His paper was largely a statistical analysis. He refused to use the term "habitual abortion" unless there was a history of at least three miscarriages. He discussed the incidence of defective embryo due to primary male or female defect, the possibility of male sub-fertility as a cause of miscarriage, and the role of a psychic factor, particularly in the first pregnancy, an acute infection, and trauma. With regard to this last it was always possible that the effect of injury in causing miscarriage might be overestimated. An abnormal embryo was not infrequent in cases of abortion, especially in first pregnancies. He did not consider that defects in the male cell were responsible for habitual abortion, though there might be some other defect in the seminal fluid. As to the Rh factor, he considered this to have no influence at all. Its real importance was not in habitual abortion, but in the danger to the woman who was Rh-negative and had a husband who was Rh-positive. A young woman in such a case was in the same position as an elderly primipara. It was important to preserve her first pregnancy at all costs, and the woman of 22 in such circumstances should be treated as if she were 42. If that patient had a stillbirth in the first pregnancy she might not have a successful pregnancy afterwards. After discussing the use of progesterone and of vitamin therapy, Mr. Linton Snaith concluded by saying that a very important part was played by chance in the spontaneous cure of habitual abortion.

Observations on Spermatozoa

A team of workers brought forward observations on spermatozoa. Dr. C. W. EMMENS, speaking of the influence of *p*H and tonicity on the viability of spermatozoa, said that, above a *p*H value of about 6, spermatozoa were completely motile. In alkaline suspension the cells tended to remain motile for as long as they were alive; in acid suspensions the motility fell off before death. Dealing with the effect of temperature on viability, he said that in a suspension cooled from 37° to 20° C. (98.6° to 68° F.) the cells were motionless, whereas in a suspension brought up from 0° to 20° C. they were active, showing that the effect of a drop in temperature as such was greater than the effect of the level of the temperature, whatever it might be. Dr. J. MACLEOD said that in some observations on human semen carried out in New York it had been found that spermatozoa in acid suspension were far more fragile than in alkaline; the latter could withstand much wider temperature variations. Dr. G. I. M. SWYER and Dr. G. KENNEDY followed with some observations on the activity of spermatozoa in relation to their density, and Mr. W. R. KELLY, a veterinary surgeon, brought forward some observations on the bacteriology of bovine semen, suggesting that bacterial growth did not influence the viability of sperm provided temperature conditions remained stable. Dr. T. MANN described the secretory functions of the seminal vesicles, and spoke in particular of fructose as a normal constituent of human semen. Fructose, and not glucose, was the physiological substance present for the metabolism of spermatozoa. The seminal vesicles acted as a reserve for this sugar. Fructose was present before the first of the spermatozoa made their appearance.

Artificial insemination was the subject of only one paper before the conference, and that only in its application to livestock improvement. Mr. R. CLARKE, a veterinary expert, said that the practice was now employed for cattle at twenty cen..es in this country. The average number of inseminations per pregnancy was 1.7 to 1.8. About 6 to 8% of the animals aborted.

Prof. H. H. COLE, of New York, spoke on the four or five hormones concerned in the control of the ovary, and touched slightly on the use of gonadotrophic hormones in clinical medicine. He described some experiments with the rat in which super-ovulation had followed gonadotrophic hormone administration.

Finally, Mr. A. F. CLIFT discussed the rheology of cervical mucus. He spoke of the difficulty of defining the consistency of this mucus, but said that certain useful objective measurements of this extraordinary material had been made. In a large number of samples the phenomenon of flow elasticity had been observed, a phenomenon affected to a remarkably slight extent by urine or water. He regarded the flow of this secretion as one of the best accessory tests for pregnancy. In the discussion the questions were raised whether it was possible by rheological observations to discover the woman who did not ovulate, and also whether the use of contraceptives had any harmful effects.

The discussions at the four sessions of the conference were eagerly sustained, and Dr. A. WALTON, Mr. JOHN STALLWORTHY and others acted as chairmen.

Mr. Bevan opened the Hospital Domestic Aids Exhibition in Regent Street, London, on July 14. Speaking of the supply of domestic workers, he said that over 2,500 women from displaced persons camps in Germany were brought to this country during the winter and were proving a great help in hospitals and sanatoria, in particular enabling nurses to be relieved of general dusting and cleaning duties.

Correspondence

The Indian Medical Service

SIR,—In the course of last week the Indian Medical Service as a service of the Crown passed away. With the other Indian Services it has received a vote of thanks from both Houses of Parliament. To the general public at home, the Indian Medical Service was a vague entity which had produced some famous men, but what it did for India is little realized even by medical men in this country.

Those of us who saw the work of that great service know that its credit rests not only on those of its members whose reputations were international, but on many others unknown in Britain whose names were household words in vast tracts of India. The debt India owes to the Indian Medical Service is beyond calculation, and we, whose medical schools produced so many of its members, should place on record some account of its achievements and the appreciation of the medical profession.—I am, etc.,

ALEXANDER HOOD,
Lieutenant-General,
Director-General, Army Medical Services.

London, S.W.7.

Intravenous Ergometrine for Retained Placenta

SIR,—"Removal of Placenta" receives a full and useful answer in the "Any Questions?" column (Aug. 2, p. 195). May I, however, comment on the use of intravenous ergometrine for placental expulsion?

When this substance was first isolated careful experiment was made to ascertain the optimum dosage. It was found that a dose of 0.25 mg. or more by *intravenous* injection produced, for a few minutes, undesirable side-effects. For that reason 0.125 mg. was recommended—a dose that appeared adequate for therapeutic purposes. Subsequent experience, however, has shown that no serious ill-effect is caused if, in an emergency, 0.25 mg. is given. This dosage now seems to have become well established; indeed, it is by this dose and by this route that ergometrine is most effectively administered. However, to double this already large dose by giving 0.5 mg., as advised in the answer, seems to be unnecessary; it will certainly result in side-effects such as dizziness, a feeling of weight and loss of power in the limbs, and possibly vomiting. The 0.5 mg. dose should be reserved for *intramuscular* injection.

With reference to the injection in retained placenta it is stated: "If, however, the placenta does not come away at once, manual removal has to be carried out without delay." Elsewhere are the words: "Even if an hour-glass contraction should result it can be dealt with at leisure once the haemorrhage is controlled." Of these conflicting statements I submit that it is the second that should be accepted, for clearly nothing is gained by a forceful removal of a placenta from a tightly contracted uterus. The chief benefit of ergometrine lies in its ability to convert a *relaxed* uterus into a *contracted* uterus; and with that change the post-partum haemorrhage (assuming the bleeding is from the uterus itself) is arrested. Thus, the opportunity is given for the obstetrician to attend to the patient's general condition, to give blood transfusion if necessary, and, if the placenta does not come away, to prepare for the anaesthetic later required for the operation of manual removal. If Credé expression is to succeed it must be performed *as soon as the fundus becomes hard, and before the lower part of the body contracts down in front of the placenta.* If the expression fails an hour should be allowed to elapse, after which the uterus will in all likelihood be relaxing at intervals; and the extraction of the placenta then becomes a relatively easy and safe operation.

It should be realized that neither ergometrine nor any other oxytocic will cause an abnormally adherent placenta to separate, although by making a soft or relaxed uterus contract it may render a Credé expression (correctly performed) possible for the first time.

Regarding the effect on the blood loss, it is a matter of opinion whether severe third-stage haemorrhage is best dealt with by injection of an oxytocic drug, or by prompt manual removal of the placenta when simpler manipulative measures have failed. My own preference, if the uterus is relaxed, is for the first method; and here there are the alternatives of (*a*) intravenous ergometrine as described, or (*b*) injection of 5 units of pitocin directly into the uterine muscle via the abdominal wall (this necessitates the use of a carefully sterilized syringe, and is, of course, possible only in cases in which the uterus can be easily manipulated against the abdominal wall).[1] With fundal injection of pitocin an immediate and very powerful effect is obtained which starts in the upper part of the uterus before it spreads elsewhere; the effect becomes quickly spent and disappears after a lapse of half an hour. These are both advantages for the purpose under consideration.

Finally, the custom in some clinics of *routine* administration of ergometrine in the third stage is mentioned. In certain American hospitals 0.2 mg. of ergonovine (ergometrine) is injected intravenously when the anterior shoulder of the foetus appears. By this method the lower pole of the uterus is held open by the breech of the baby, thus eliminating the possibility of an hour-glass contraction; expulsion of the placenta along with the foetus is then the rule. Even the exponents of this method admit, however, that it should be used only in hospital practice, for, despite theory, retained placentas do occasionally occur.—I am, etc.,

Nuffield Department of Obstetrics and Gynaecology, Oxford. J. CHASSAR MOIR.

REFERENCE

1 *J. Obstet. Gynæc. Brit. Emp.*, 1944, 51, 247.

Blood Transfusion in the War of 1939–45

SIR,—Major-General Philip H. Mitchiner in his review of "Surgery in Two Wars" (Aug. 9, p. 219) rightly stressed the excellent organization and widespread application of blood transfusion in the 1939–45 war. The wounded in 1939–45 were transfused earlier and in quantity by comparison with which that used in 1914–18 was almost negligible. It is this factor, I contend, which renders the table of comparative mortalities given on page 200 both fallacious and misleading.

Major-General Mitchiner stressed the mobility of the 1939–45 war but not the consequent lengthening of the lines of communication in comparison with those in 1914–18. Were it not for the fact that the wounded had often been transfused either at the R.A.P., F.D.S., or M.D.S., and perhaps had the benefit of a "travelling transfusion" in the ambulance as well, many of the wounded operated on in the advanced surgical centres in 1939–45 would have died *en route*. In short, the proportion of "bad risks" (often desperate risks) *must* have been greater in 1939–45 than in 1914–18.

It is my submission that if it were possible to apply the necessary correction to the 1939–45 figures the true mortality would demonstrate an even greater advance than that shown by the table on page 200. While not disputing the great benefits of female nursing mentioned by Major-General Mitchiner, he scarcely does justice to those highly skilled nursing orderlies, like Sergt. Scannell, M.M., R.A.M.C., who carried on in the Desert in 1941–2 when there were no female nurses further forward than Alexandria.—I am, etc.,

REX BINNING,
Hon. Major, R.A.M.C.

Salaries of Specialists in N.H.S.

SIR,—Dr. Clifford Allen (Aug. 2, p. 189) has drawn attention to the lower salary offered psychiatrists than other specialists in Iraq. Such a danger appears a possibility nearer home. Some weeks ago you reported a comment from an important quarter that the question of relative payments of different types of specialists must soon be considered; a differentiation being made between physicians and surgeons, who were concerned with "matters of life and death," and other less onerous specialties. For some reason—possibly a common greater penetrative ability?—psychiatrists and radiologists were classed together, and both relegated to the latter group.

I cannot speak for radiologists, but in regard to psychiatry this classification appears to be founded on a popular miscon-

ception that a psychiatrist has an innocuous job, dealing exclusively with "harmless" psychoneurotics. On the contrary, psychiatrists have far-reaching decisions to make, both from the medical standpoint and in regard to the community, e.g., whether to deprive a patient of his liberty by certification, or to allow certain psychotics to continue at work; whether a patient is fit to be safely discharged from hospital; advising how far he is responsible for his acts in case of crime; administering physical therapy by no means devoid of risk. Questions of life and death are acutely raised every time we have to assess the degree of suicidal risk in a depressed patient—a very frequent problem—or the danger of violence in a paranoiac or in a manic, with the possibility of assault or even being murdered as the penalty of mistaken judgment. And the latter risk even the surgeon does not have to run!

No, Sir, I submit there are no grounds for differentiating one specialty from another because of differing responsibility. The reason a specialist gets more pay is surely fundamentally because he has had a longer, and consequently more expensive, training than his non-specialist colleague. Dr. Clifford Allen invites the views of other psychiatrists. I think it would be of interest to hear the views of other specialists as well on what is a particularly important subject at the moment.—I am, etc.,

London, W.1. W. LINDESAY NEUSTATTER.

Negotiations with the Minister

SIR,—We are told in your issue of Aug. 2 (p. 178) that since the first formal meeting which the present Negotiating Committee had with the Minister it has never met him personally but has conducted the negotiations only with officials (Civil Servants), and that during this interval of six months, while complete secrecy has been observed by the Negotiating Committee, it has had to depend for its contacts with the Minister wholly upon what the officials reported.

One cannot but recall the experience of an earlier Committee called the "Representative Committee" of the medical profession, which had been created at the invitation of the Minister, Mr. Ernest Brown (1942–3). The Minister had promised that the negotiations would be "conducted from the ground," but at his very first meeting with the Committee (March 9, 1943) the Committee was informed by the Minister that "negotiations must be based on the acceptance of the decision by the Cabinet that a single unified health service, covering 100% of the population, would be instituted, the local administration of which would be in the hands of the local authorities, under the ultimate control of a Minister who would be responsible to Parliament," thus breaking his previous promise that the negotiations would be "conducted from the ground." (See my letter in *The Times* of Sept. 17, 1943.)

On April 12, 1943, *The Times*, apprised—not by the Committee—of this development, declared that "the medical profession must recognize that the settlement of the future of medical practice has been reached." This experience is not a good augury for the outcome of the present negotiations, conducted in the same atmosphere of secrecy enjoined by the Minister upon the Committee, but without any corresponding restriction of his own activity. Indeed, the Minister has been extremely assiduous in carrying on with his plans, while enforcing confidentiality upon the Negotiating Committee. He has been busy appointing the Regional Boards which are to govern the profession (his selection largely ignoring the B.M.A.), and his choice of his own partisans to serve thereon has been the subject of criticism in the House.

Still more recently he has given a new exhibition of autocracy in the creation of the wholly novel category of "general practitioner obstetricians," whom I think one can fairly describe as "pseudo-consultants," their selection being governed by the Minister who has the power under the Act of designating any registered medical practitioner as a specialist or consultant. His proposal is to issue a list of general practitioners so selected, whom registered medical practitioners not upon that list are enjoined to consult in midwifery cases. The necessary consequence of this creation must, as I see it, be a denial of the present right secured to every registered medical practitioner to practise medicine, surgery, and midwifery. This contemplated restriction affects at present midwifery only, but unless now resisted successfully by the profession will, I submit, be extended to other basic branches of medical practice.—I am, etc.,

London, S.W.1. E. GRAHAM-LITTLE.

The Lazy Eye

SIR,—It is common to see young children wearing spectacles with one eye occluded, in order, it is intended, to "train a lazy eye." One hand, usually the right, is by nature more apt in learning to write, and one eye, usually on the same side as that hand, is more effective in the visual discrimination of the graphic symbol. If that eye is prevented from use, the result is equivalent to immobilizing the dominant hand, and, given equal bilateral vision, the "lazy" eye is never the master.

The general result of this procedure is educational backwardness, which should never be taken lightly, because it is the commonest associated symptom in behaviour disorders, and, in predisposed subjects, it may even initiate neurosis. The backwardness depends on these specific disturbances of reading, spelling, composition, and written work generally, including arithmetic, which follow interference with the development of the natural dominance of hand and eye, and are described in detail in works on education such as Burt's *The Backward Child* and Schonell's *Backwardness in the Basic Subjects*. Disturbances of speech are not uncommon.

These effects are neuro-physiological, and follow only after the "treatment" has been continued for a considerable time, but a "lazy" eye is not quickly trained. Since the condition is nearly always optical in origin, often a hypermetropia, surely the rational treatment should be optical too.—I am, etc.,

London, W.1. WILLIAM MOODIE.

Manifestations of Malnutrition

SIR,—Dr. R. G. S. Whitfield in his interesting article (Aug. 2, p. 164) mentions the fact that the classical conceptions of beriberi and pellagra fail to illustrate the clinical pictures presented by malnourished or starved populations. This was further emphasized, for those who worked in the prisoner-of-war hospital camps in Singapore from 1942 to 1945, by the fact that among many hundreds of cases of malnutrition and deficiency disease scarcely a single clear-cut case of beriberi, and probably no clear-cut case of pellagra, was seen. In fact, these terms were not used after the first few months' captivity, and instead a diagnosis was stated as "avitaminosis B," followed by the principal symptom, such as "avitaminosis B, peripheral neuritis."

The list of conditions thus recognized as clinical entities was:

Avitaminosis B_1	oedema and dyspnoea
"	abnormality of heart rate, bradycardia
"	abnormality of heart rhythm, multiple premature systoles
"	abnormality of blood pressure, hypopiesia, rising diastolic pressure
"	abnormality of digestive tract, anorexia
"	abnormality of cerebral function, Wernicke's encephalopathy
"	peripheral neuritis
Avitaminosis B_2	scrotal dermatitis
"	angular stomatitis with marginal glossitis
"	ulcerative stomatitis
"	pellagroid skin changes with ulcerative stomatitis and permanent skin discoloration
"	pellagroid dermatitis
"	seborrhoeic dermatitis of face
"	corneal degeneration
"	retrobulbar neuritis
"	"painful-feet" syndrome
"	spastic paraplegia

These conditions occurred either alone or in combination with one another, and a notable feature of their occurrence was the epidemic nature of their appearance. Thus at one time the most urgent problem was the pellagroid dermatitis with ulcerative stomatitis; at another, retrobulbar neuritis; and at another, the "painful-feet" syndrome. Although the "epidemics" overlapped, and although some conditions, especially angular

stomatitis with glossitis, were endemic rather than epidemic, nevertheless it was possible to recognize that certain of these clinical entities were more common at one time than at another, and that an increase of one condition did not necessarily herald or accompany an increase of the others.

Of course many more conditions could be added to this list by those whose practice led them into contact with different climatic or environmental conditions, as, for example, the "human-milk intoxication" of Fehily.[1] Similar observations have suggested to several workers that the symptoms of vitamin-B deficiency depend not so much on the lack of some specific component of the now large list of vitamins but upon the upset of that fine balance of chemical reactions that constitute the "internal milieu" of the organism, and that this upset of balance can be caused not only by deficient intake of certain components but also by abnormal proportions of such components in the diet.[2]

If the terms "beriberi" and "pellagra" were abandoned and some terminology such as the one described above were adopted we should probably be in a position to understand the vagaries of vitamin deficiency better than we do at present, and also to recognize them more often than we do in the course of normal clinical practice. The term "dietary imbalance" would probably be preferable to "avitaminosis," however, as being more inclusive and more non-committal.—I am, etc.,

Dublin. B. MAYNE.

REFERENCES

1 Fehily, L. (1944). *British Medical Journal*, **2**, 592.
2 Sydenstricker, V. P. (1941). *Ann. Intern. Med.*, **2**, 1499.

SIR,—I was very interested in Dr. R. G. S. Whitfield's article (Aug. 2, p. 164) on anomalous manifestations of malnutrition in Japanese prison camps, especially with reference to "Fits." I saw a case in Nakom Paton Allied P.O.W. hospital in Siam which corresponds; it was the only one of its kind I encountered.

The patient, a British sergeant from a Malayan volunteer force, aged 40, was of pyknic build and in relatively good condition. He had been lucky, as he was employed as a medical orderly for the whole of his captivity at the base camp of the Siam-Burma railway. He only came to Nakom Paton near the end of the war as a member of the running staff. Without warning one day everything went blank and he fell with a crash, damaging his face. He was not doing any physical work at the time. I did not, unfortunately, see the fit, but onlookers gave a typical epileptical description. He was carefully examined by an eminent Australian physician, who decided on epilepsy. As I had known the patient personally since University days I knew he had no history or suggestion of this, and found myself unable to agree with the diagnosis. I finally decided it was a psychoneurotic manifestation, more especially as I knew he had been worrying about his wife, who had not been heard of since she left Singapore on a ship shortly before capitulation, and who finally was located after the war in a Japanese internment camp in the Dutch East Indies.

Such a suggestion seems also to have been thrown out by Dr. Whitfield with regards to his four "fits" patients in Mitsoshima.—I am, etc.,

LENOX MACFARLANE,
Lieut.-Col., R.A.M.C.

Blood Gravity and Haemoglobin

SIR,—I would like to add a more critical opinion as to the value of the estimation of plasma and serum protein by the copper sulphate specific gravity technique than that expressed in the annotation (Aug. 9, p. 217). To the repeated assertion that this is an accurate method of estimating protein my findings in a large series of tests make it impossible to agree.

In 450 tests where duplicate estimations of the protein content of plasma and serum were made by the falling-drop specific gravity technique of Barbour and Hamilton[1] and by an accurate micro-Kjeldahl technique,[2] in 12.4% of these tests there was a difference of 0.5 g. per 100 ml. or over: in one instance this difference was no less than 1.76 g. The changes in the non-protein nitrogen were insufficient to explain these differences. No test was found by which to foretell whether the correlation of the results by the two methods would be close or widely divergent. Later experience with the copper sulphate method of estimating the specific gravity has been no more satisfactory than the Barbour and Hamilton technique.

Criticism of the specific gravity technique of estimating protein has been made by Looney[3] and by Zozaya.[4] The latter found that the test could not be used even to follow the protein changes in an individual patient where the non-protein factors which affect the specific gravity might be expected to be fairly constant. Contrary to the statement in the annotation, the specific gravity of plasma and serum is markedly affected by factors other than the proteins.

A more detailed report of our results will appear elsewhere.[5]—I am, etc.,

Biochemical Department, Royal Infirmary, Sunderland. JOHN HARKNESS.

REFERENCES

1 Barbour, H. G., and Hamilton, W. F. (1926). *J. biol. Chem.*, **69**, 625.
2 Harkness, J., and Whittington, R. B. (1947). *Anal. chim. Acta* **1**, 153.
3 Looney, J. M. (1941–2). *J. Lab. clin. Med.*, **27**, 1463.
4 Zozaya, J. (1935). *J. biol. Chem.*, **110**, 599.
—— (1938). *J. phys. Chem.*, **42**, 657.
5 Harkness J. and Whittington R. B. *Anal. chim. Acta* (in press).

Transport of Patients to Voluntary Hospitals

SIR,—In these days of strenuous work is it necessary that general practitioners should be obliged to undertake the duty of arranging with voluntary hospitals for the transport of patients who are to be admitted to the general wards? The present ambulance organization in London is deplorable except for patients going to municipal hospitals. County Hall now refers us to the voluntary hospital concerned. The hospital telephonist has no idea whose department is responsible. The secretary's office is no better informed. The almoners are anxious to be helpful, but take a long time to discover which administrative rope should be pulled. When their department is shut our plight is indeed desperate. I have frequently spent a half to three-quarters of an hour on this job, which formerly was completed in less than five minutes when it was done by direct contact with County Hall.

Who benefits by this new scheme? What disadvantages lay with the old scheme, which appeared from the doctor's angle to be a model of convenience and efficiency? The new scheme is time-consuming and infuriating to all concerned.—I am, etc.,

London, S.W.10. A. E. B. HARDING.

POINTS FROM LETTERS

Cloud Cuckoo Land

Dr. G. C. PETHER (Colchester) writes: Mr. Wilfrid Adams's commentary (Aug. 2, p. 190) on my letter to you is perfectly fair, and I should be the last to suggest that before the war all was perfect in the medical world. But I do suggest very strongly that the public and the politicians have seized upon our imaginary shortcomings to salve their own consciences. I think it is true that medicine is distinguished by a complete absence of secrecy about recent and proven advances. Its outlook is humane and international, and it is particularly well informed of progress in other countries. Can we say the same of those who build our houses, grow and merchant our food, provide our daily papers, and spread hatred and distrust from the political platform? It is surely these people who can make or mar our physical and mental health. Our contribution must ever be small relative to that of the non-medical groups.

Concerning his last point I think it is true that we have made no secret of our views about proprietary medicines and patent foods. With a few exceptions others in the public eye seem neither to know nor care. . . . I still think that our professional contribution to health is creditable and that standards in many other occupations fall far below our own. . . .

Treatment of Hydrocele by Injection

Dr. R. M. S. MCCONAGHEY (Dartmouth) writes: Dr. J. W. Nicolson (Aug. 2, p. 188) states that for many years several sclerosing substances have been used for the treatment of hydrocele. James Syme, of Edinburgh, in a clinical lecture dated 1851, said that "he had long since ceased to employ port wine for injection into the tunica vaginalis, on account of its proving very uncertain; and that during the last five years he had always injected the tincture of iodine alone and without a single case of failure. . . . The quantity required was about a teaspoonful, or as much as filled a common pewter sixpenny syringe, which was the most convenient instrument for the operation." (*Memorials of the Life of James Syme*, by Robert Paterson, Edinburgh, 1874.) One is at liberty to ponder whether the uncertainty of action of the port wine was dependent on the vintage.

Obituary

ELLIOTT C. CUTLER, M.D., F.A.C.S., F.R.C.S.

We announce with regret the death of Elliott C. Cutler, Surgeon-in-Chief of the Peter Bent Brigham Hospital, Boston, Mass., and formerly Chief Consulting Surgeon to the United States Army in Europe. Only a few weeks ago (Aug. 2, p. 182) we recorded his election as President of the American Surgical Association. The U.S.A. War Department recently conferred on him a second Distinguished Service Medal, and the Boston Surgical Society had awarded him the Honorary Jacob Bigelow Gold Medal.

We are much indebted to Sir Gordon Gordon-Taylor for the following appreciation:

Elliott Carr Cutler came of a Puritan stock which migrated from Norfolk to the shores of America in the days of the *Mayflower* and in the early years of the seventeenth century. Alongside his forebears came men with names like Saltonstall, Winthrop, and others—distinguished families with whom the Cutlers are related by marriage ties to this day. His background was therefore no ordinary one; his father had earned the regard of all men, and to-day the name of Cutler commands respect and esteem not only in Massachusetts but along the whole Eastern seaboard of the United States. The calibre of the modern Cutler stock may be gauged by the fact that in the recent war two of the brothers attained the rank of brigadier-general, while a third became a rear-admiral in the United States Navy; each one of Elliott's sons served in the United States forces, and his eldest boy was wounded in Northern France.

Elliott Cutler was educated at Boston and was proud to have graduated from Harvard University. His surgical apprenticeships were served with Halsted at Johns Hopkins, Czerny at Heidelberg, Perthes at Tübingen, and others. During the first world war he had experience of war surgery, visiting Europe at two separate periods under the aegis of Harvey Cushing, who frequently referred to the energy, ability, and enthusiasm of his young colleague in the pages of his story of the first great conflict. After the war Elliott returned to Boston, and subsequently he became professor of surgery at Cleveland, Ohio. Thence he returned to his native city, on the retirement of Harvey Cushing, to become Moseley Professor of Surgery at Harvard University and surgeon-in-chief of the Peter Bent Brigham Hospital.

Many of our readers and those of the *British Journal of Surgery*, on the Editorial Committee of which he served, and most present-day British surgeons will remember Elliott Cutler as the chief consulting surgeon to the E.T.O.U.S.A. No more happy choice of a consulting surgeon for an army that was to fight shoulder to shoulder with an ally, training in the land of that ally, and fighting alongside that ally on the battlefields of Europe, can ever have been made. By the autumn of 1941 he already possessed the vision or knowledge that the time was not far distant when the United States of America were to be immersed in the conflict that was threatening to extinguish freedom and civilization. With indefatigable energy he had already planned in fullest detail the medical arrangements for the city in the event of air attack on Boston. But when war actually came to North America he was not satisfied with any prosaic, comfortable post at home; his old uniform of the first world war still fitted him, he appropriated his officer son's army waterproof coat, buckled on his belt, and he was ready for any part of the world to which authority might direct him.

The long period of training and preparation in Britain happily introduced him to many British surgeons, especially to those who wore a uniform, but he was a frequent and always-welcome visitor at the Royal College of Surgeons of England and the Royal Society of Medicine, and both bodies made him an Honorary Fellow before the war was over. With Sir Henry Tidy and L. R. Broster he instituted the successful monthly Inter-Allied Meetings which were held within the precincts of the Royal Society of Medicine, where medical and surgical problems of Service interest were discussed *in camera*. The slight, erect, soldierly figure, immaculately dressed, perfectly groomed, the unvarying bonhomie, the attractive voice, the charming smile seemed to make Elliott Cutler a veritable paladin. His knowledge of history and of the world's best literature, with which his library was stocked, gave him mastery of words and lucidity of expression. While jealously loyal to his own colleagues and juniors, Elliott was ready to admire all that was best in the practice of his British brother officers, and he was not oblivious of the fact that experience in war surgery counts for much.

These attributes made Elliott Cutler one of the most wonderful ambassadors in surgery that the world has known. He may not have possessed the surgical stature of another great surgical ambassador, Lord Moynihan; he may not have attained the same flights of oratory, he may not even have enjoyed that supreme power of the pen; but Elliott's were gifts of the heart, and to him belonged a real genius for friendship and a wondrous and charming hospitality that drew all men to him. Not a few from this land have enjoyed the hospitality of that home in Brookline which was his father's before him, where his own sons were born, where, with his charming wife, Carol, he spent all the happy days of his Boston surgical appointments, and where he drew his last breath.

His membership of a surgical mission to the U.S.S.R. in 1943 evoked in him an intense admiration of Soviet achievement, and no surgeon worked harder to strengthen an *entente* between his own land and Stalin's great country. He was delighted to bestow the Honorary Fellowship of the American College of Surgeons upon Judin and Burdenko.

Elliott had always driven the chariot of his busy, feverish life with rein unchecked; not one moment of the day wasted, no evenings "steeped in honied indolence." Even when the truth of his mortal illness came "naked and sabre-like" against his great heart the pace of life never slackened. There was no neglect of the surgical direction of his hospital; he travelled all over the wide acres of the United States of America in his supreme desire that the surgical arrangements and the surgery for the veterans of the recent war should be the very best. The term "deputy" found no place in his vocabulary. He was the central, supreme, joyous figure at the marriages of his sons; he flew up from Georgia to present his commander-in-chief, General Eisenhower, for an Honorary Degree at Harvard; he changed his wedding garment for his uniform in his car *coram publico* in a traffic "jam" near Boston harbour! Despite his malady he flew down to the yacht races at "The Vineyard" because he was the commodore; drove his car back at break-neck speed to attend the memorial service to a relative, prepared discourses in acknowledgment of the Honorary Degrees that universities jostled with each other to confer upon him. No complaint of the unkind blow of Fate ever passed his lips; the courage of the man evoked admiration on every hand.

In the art of surgery he did pioneer work in the operative treatment of valvular disease of the heart. Men who were his pupils, like "Bobby" Gross and Dwight Harken, each in his own province of cardiological surgery, have carried on the work which he started and have made world-wide reputations while still young.

Elliott's own technique was careful, deliberate, if slow; the Brigham tradition perhaps prevented any display of brilliance of which he himself was indubitably capable. His industry showed itself in the training of disciples rather than in the writing of books; his literary output consisted mainly of contributions to surgical journals, although a book on operative surgery, under the joint authorship of Robert Zollinger and himself, came from his pencil and pen.

His name will live on in that great galaxy of young surgeons whom he trained and inspired, who adored him, who accompanied him across the seas to the hospitals in Britain and France, and who are now in increasing numbers filling important surgical posts, carrying on the "Cutler tradition." Not less will "Elliott" be mourned by that host of men and women on this side of the Atlantic to whom he brought friendship, encouragement, and affection in the dark days of the war.

Dr. Allan Chilcott Parsons died suddenly on March 29 at the age of 74. Dr. Parsons was well known in the West African medical service. Born at Portland, Dorset, the eldest son of Dr. F. J. Parsons, he was educated at Dorchester Grammar School and at the Royal Medical College, Epsom. A student of St. Thomas's and King's College, he qualified in 1898, and

took the certificate in tropical medicine of the London School of Tropical Medicine in 1903. He had served in the Artists' Rifles during the South African War, and in 1903 he went out to Northern Nigeria as the first medical officer to be posted to the area bordering on Lake Chad. After ten years in Nigeria he was transferred to the Gold Coast, where he became chief sanitary officer of the capital and port of Accra. He was out there during the 1914–18 war and served as a medical officer in the Togoland campaign. In 1916, while on leave in this country, he was seconded to the R.A.M.C. and served for the rest of the war in the Western, Northern, and Aldershot Commands with the rank of major. After the war he left the Colonial Service and joined the staff of the newly formed Ministry of Health. On his retirement from the Ministry he became a member of the South Eastern Area Guardians Committee, for which he did much valuable work. In the recent war he joined the Emergency Medical Service, and was on the staff of Redhill County Hospital, where he continued to work up to the time of his death, acting for the last few years as medical officer in charge of records. Apart from his public and professional activities he found time and energy for many other interests, and was well known as a naturalist, a tennis player, and a horticulturist. Among his publications were the *Hausa Phrase Book* and a chapter on malaria in Byam's *Practical Medicine in the Tropics*, and he was also responsible for one of the Ministry of Health Reports on encephalitis lethargica.

Dr. JOSEPH EDWARD JUDSON died at his home in Bournemouth on July 27. Dr. Judson was a student at Owens College, Manchester, and qualified in 1900. He was assistant demonstrator in anatomy for a time, and later house-surgeon at the Manchester Royal Infirmary and then at Ashton-under-Lyne Infirmary. He settled in Ashton-under-Lyne and was in general practice there for many years, entering into partnership with Dr. J. Bissitt Smith. He served with the rank of captain in the R.A.M.C. in the 1914–18 war, and he was on the consulting staff of the District Infirmary and Children's Hospital. Although he had been living in retirement for some years, his passing will be regretted by many friends and colleagues in Ashton.

Dr. WILLIAM STEWART STALKER died in Southport on July 29. A student of Glasgow University and King's College, London, he qualified in 1899, took the D.P.H. in 1909, and proceeded M.D. in 1912. On April 21, 1913, Dr. Stalker was appointed the first whole-time medical officer of health to the borough of Swinton, Lancs, then an urban district. Dr. Stalker resigned this position in August, 1921, to take up a similar post with the borough of Bromley in Kent.

A. E. W. writes: There are several officials who worked with Dr. Stalker who are still serving in Swinton, and without exception they remember and speak highly of his achievements during the period of his office here, and are deeply grieved at his passing. Swinton had no medical service as we know it to-day when Dr. Stalker took up his duties, and it required a keen and energetic person with vision for future planning. He laid the foundations of an efficient public health service, embracing the school medical and maternity and child welfare clinics. Closely associated with the school medical service was his work as a certifying factory surgeon, which was advantageous to the child leaving school and entering the factory or workshop. One of the monuments to Dr. Stalker's foresight and planning was the erection of an open-air school, one of the finest of its kind in the country, to replace the Army hut which served this purpose originally.

Mr. H. W. S. Wright (London, W.1) writes: I have just read with dismay, and more than regret, the notice of the death of Mr. J. Scouler Buchanan (Aug. 16, p. 275). It was only about six weeks ago that I had the privilege of spending a day with him, watching him operate, and going round his wards. One could not but be impressed by the wide range of his surgical interest, his patient judgment, and his clinical ability. The quality of the men he trained, their affectionate loyalty and esteem, and his own surgical ability had the hallmark of a fine surgeon. One had the impression that he was the sort of person that one would like to operate on oneself, if ever it were necessary. He was a member of the Council of the Association of Surgeons, and we all looked forward to meeting him once or twice a year for an hour or two; and his wise, unselfish advice was always valuable because, although he was devoted to Glasgow and its reputation, he had a wide and kindly outlook on the rest of the world and its problems. He will be missed and regretted by friends and colleagues all over the country, and his wife and children may be assured of all our understanding and sympathy.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on July 27 the following degrees were conferred:

D.M.—*A. R. Norton.

M.Ch.—E. E. Taylor.

B.M.—B. V. McEvedy, R. Harvard-Davis, M. S. Kay, R. A. M. Oliver, J. M. Workman, A. L. Turnbull, L. J. Cawley, A. G. Parks, R. Alhadeff, M. L. H. Lee, Mary P. S. Dalton, Unity R. Allen, Olive P. Frodsham, Jessie F. Robertson, S. Wolff, *R. A. Griffiths, *C. B. Wynn-Parry, *R. A. Chambers, *C. Pallis, *G. E. Honey, *C. C. Kennedy, *H. M. Lloyd, *R. H. Balme, *R. Seidelin, *J. H. B. Yule, *J. Slator, *Isabel H. Burn, *Jean Dutton.

* In absence

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

M.D.—*Branch I (Medicine)*: R. F. Butterworth, J. Colover, J. D. Craig, P. E. Dipple, D. G. Evans, P. R. C. Evans, F. S. Gorrill, E. R. Gubbay, G. R. Handy, J. Jacobs, A. M. Jelliffe, D. Lawrence, P. M. C. Mark, A. N. T. Meneces, L. Nancekievill, D. P. Nicholson, J. H. Paterson, A. B. Pollard, G. S. C. Sowry, A. G. Spencer, P. Stradling, D. J. Thomas, K. B. Thornton, W. G. Tillmann, S. D. V. Weller, M. Zoob. *Branch II (Pathology)*: Isobel P. Beswick, F. A. Denz, A. W. Grace, R. E. B. Hudson, D. Long, K. J. Randall, B. A. D. Stocker. *Branch IV (Midwifery and Diseases of Women)*: I. Donald. *Branch V (Hygiene)*: Margaret E. R. Balfour, B. W. Davy, J. P. Fox, W. E. Greenwood, J. P. W. Hughes, H. I. H. Porcher, M. H. Rotman, C. A. Royde, R. S. F. Schilling, C. H. Shaw, Beatrice M. Thompson, K. O. A. Vickery, J. H. Whittles. *Branch VI (Tropical Medicine)*: D. A. Andersen, J. I. Lesh, H. M. Rice, W. F. Townsend-Coles.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

The following candidates have been approved at the examination indicated:

D.T.M.&H.—G. M. Abraham, J. F. Britto, J. H. Cater, K. H. Cheung, S. Childs, L. M. B. Copland, M. A. C. Dowling, A. J. F. Eberle, E. N. Emmerson, Z. A. Fazelbhoy, S. K. Ganguli, V. T. H. Gunaratne, M. T. Gyi, V. W. D. Hall, W. D. Hughes, J. P. F. Hummel, M. P. Hutchinson, F. C. Kerr, S. Khayatt, S. N. Kothare, N. W. Low, P. C. Mahanty, B. K. Naik, A. A. Odier, A-H. A-R. Omar, C. P. Patel, D. N. Patel, A. J. Patterson, R. A. O'G. Pearson, J. G. Salter, J. P. Satterwhite, R. S. Saxton, J. C. Shee, R. P. Shields, K. G. B. Stork, R. Symons, S. W. W. Terry, W. F. J. M. Thom, E. Tuckman, H. W. Wheate, H. H. Wozniak, G. B. Wright. *Successful in Part B under old regulations*: K. P. Hare.

The Lalcaca Medal and the William Simpson Prize, awarded to the best student in the D.T.M.&H. class during the year, have been won by Dr. Henry S. Fuller of the first course of the academic year, 1946–7.

G. L. W. Bonney has been approved in the Branch I (Surgery) examination for the degree of M.S.

UNIVERSITY OF MANCHESTER

The following appointments have been made: *Clinical Director of the Research Centre for Chronic Rheumatism*, J. H. Kellgren, F.R.C.S.; *Lecturer in Cardiology and Deputy Director of the Department*, A. Morgan Jones, M.B., Ch.B., M.R.C.P.; *Lecturer in Surgery*, J. Loewenthal, M.S., F.R.C.S.; *Lecturer in Ophthalmology*, A. Stanworth, M.B., Ch.B., D.O.M.S.; *Lecturer in Diseases of the Ear, Nose, and Throat*, N. A. J. Young, F.R.C.S.Ed.; *Lecturer in Medical Neurology*, G. S. Graveson, M.D., M.R.C.P.

UNIVERSITY OF DURHAM

Dr. Frank H. Lahey will deliver the second Rutherford Morison Lecture in the Royal Victoria Infirmary, Newcastle-upon-Tyne, on Sept. 25, at 5 p.m. His subject is "Thyrotoxicosis, Thyroidectomy, Thiouracil."

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The following candidates were successful in the recent Primary Fellowship examination conducted by the College:

N. H. Antia, D. Banerjee, D. Bartlett, P. H. Beales, J. Block, D. E. Bolt, J. F. Bolton Carter, T. Burke, T. G. Cameron, T. O. Candler, H. Chaudhuri, C. D. Clark, R. I. Cohen, P. W. Cotter, R. P. Crick, P. I. Cromack, P. J. Damato, O. Daniel, T. C. H. Davies, B. H. Egerton, T. Fenwick, V. S. Van V. Fernand, T. H. Fisher, D. W. Fleming, N. A. Fowler, E. K. Gardner, E. Griffiths, M. Hershman, A. C. Hicks, N. S. Hooton, E. W. Ilangantileke, P. H. Jayes, D. H. Jenkins, E. Jones, K. V. J. Kearney, A. U. Khan, J. M. Large, G. H. Levien, J. S. A. Linton, W. C. Lyon, A. B. Mackenzie, R. A Megally, J. W. Montgomery, T. P. Morley, A. O. A. Ohannessian, B. M. Omar, E. N. Owen, E. H. Paterson, V. T. Pearse, M. F. Pilcher, D. W. Purser, M. A. Radwan, A. J. H. Rains, D. G. Reinold, J. P. I. Rose, D. T. Rowlands, E. P. Samuel, N. J. Shah, I. M. Shulman, J. H. Smart, H. G. Stack, D. H. Teasdale, C. L. Tucker, A. R. Wakefield, B. W. Wells, H. G. Williams, A. M. E. A. Zikry.

No. 31

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Aug. 2.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1947					1946 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	48	11	17	2	1	44	5	15	—	3
Deaths		—	2				—	—		
Diphtheria	200	26	29	16	6	246	18	69	23	15
Deaths	2	—	—		1	1	—	—	—	—
Dysentery	53	9	10	—	—	59	8	28	—	—
Deaths					—				—	—
Encephalitis lethargica, acute	2	—	—	—	—	1	—	1	—	—
Deaths		—					—			
Erysipelas			22	8	2			25	6	6
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				52					48	
Deaths	52	4	17		1	36	6	7	30	1
Measles*	6,954	366	61	336	8	3,540	376	98	34	15
Deaths	1	—	—		—	1	—	1	—	—
Ophthalmia neonatorum	80	7	19	3	1	72	7	15	—	—
Deaths										
Paratyphoid fever	19	—	1(A)	1(B)	—	7	—	1(B)	—	2(B)
Deaths	—	—	—		—	—	—	—	—	—
Pneumonia, influenzal	271	17	1	—	3	356	26	1	1	3
Deaths (from influenza)†	3	—	—		—	4	1	—	—	—
Pneumonia, primary			79	17				138	12	
Deaths		20			6		19		3	9
Polio-encephalitis, acute	39	7				1	—			
Deaths		—					—			
Poliomyelitis, acute	448	53	37	5	11	23	1	—	3	1
Deaths		3					—			
Puerperal fever		—	9		—		5	20		—
Deaths										
Puerperal pyrexia‡	145	14	6	—	3	146	10	14	1	—
Deaths		—					1			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	803	80	98	32	20	940	82	134	20	14
Deaths	—	—	—		—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	6	—	4	3	2	60	1	7	4	1
Deaths	—	—	—		—	—	—	1	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough*	1,737	195	29	71	5	2,092	159	35	41	27
Deaths	8	2	—		3	7	—	1	1	1
Deaths (0–1 year)	320	45	67		7	337	50	51	45	10
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,900	609	530		101	3,802	587	517	166	99
Annual death rate (per 1,000 persons living)			11·0					11·4	10·6	
Live births	8,972	1404	1073		251	8,367	1250	1004	506	238
Annual rate per 1,000 persons living			21·6					20·2	32·4	
Stillbirths	252	32	40			265	37	28		
Rate per 1,000 total births (including stillborn)			36					27		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

It is still not possible to publish the return of births and deaths for Eire for the weeks ended July 26 and Aug. 2.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

The notifications of poliomyelitis in England and Wales for the week ending Aug. 9 numbered 568, compared with 448, 302, and 177 in the three preceding weeks. The rate of increase from week to week is therefore 27% now, as against something of the order of 50% in the previous weeks. This may have little or no significance, or it may mean that the curve of incidence will now begin to flatten out.

There were increases in notifications in the following county areas (the figures for the previous week are shown in parentheses): London 84 (53); Lancashire 71 (36); Middlesex 35 (20); Kent 21 (13).

There were decreases in notifications in the following county areas (again the figures for the previous week are shown in parentheses): Yorkshire W.R. 57 (70); Durham 36 (45); Surrey 24 (32); Yorkshire E.R. 5 (16).

Notifications of polio-encephalitis have shown an abrupt rise to 56 in the week ending Aug. 9. The figures for the last six weeks were: 9, 16, 16, 34, 39, and now 56. This rise may be more apparent than real. In a few areas cases of poliomyelitis with some bulbar involvement may have been notified as cases of polio-encephalitis.

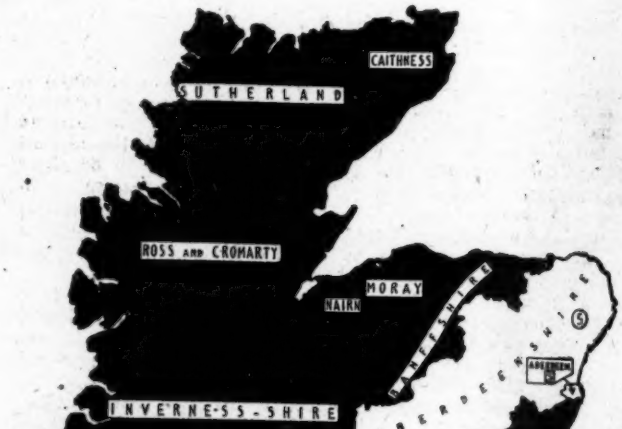


FIG. 1.—Scotland

The two maps show the distribution of cases of poliomyelitis in Scotland and in London. They should be compared with the map showing the distribution in England and Wales which we published in our issue of Aug. 9 (p. 234). The map of Scotland (Fig. 1) gives the distribution by counties of 63 cases of poliomyelitis notified during the five weeks ending July 26. The areas shown in black had no cases. Ringed figures indicate the notifications by counties, and these

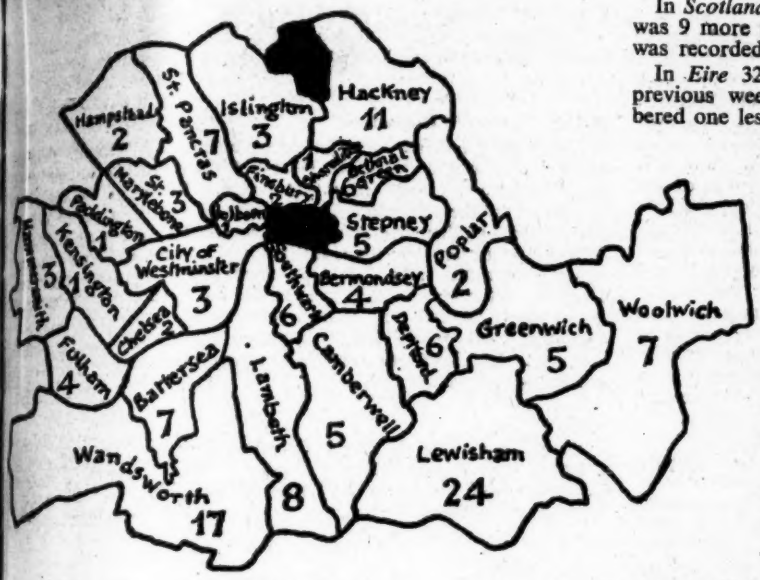


FIG. 2.—London

include the figures given in squares, which show the incidence in particular towns. Thus all 5 cases in Aberdeenshire were in the city of Aberdeen; of the 4 cases in Fifeshire 3 were notified in Kirkcaldy. Glasgow continues to have the highest incidence of cases, and by Aug. 15 there had been 84 cases admitted to the Glasgow fever hospitals since the beginning of June. There were in addition about 20 suspected cases. Of the first 64 cases (34 males, 30 females) 5 have already made a complete recovery, and there have been 4 deaths.

The map of London (Fig. 2) shows the distribution by Metropolitan Boroughs of the County of London of 146 cases of poliomyelitis notified during the six weeks ending Aug. 2. The two areas which are shown in black and which had no cases were the City of London and the Borough of Stoke Newington. Over this six-week period the three boroughs which showed the highest incidence were Lewisham 24, Wandsworth 17, and Hackney 11.

We announced last week (Aug. 16, p. 260) that the Emergency Bed Service was responsible for allocating the beds set aside for cases of poliomyelitis in the London teaching hospitals. The telephone number of the Emergency Bed Service was then incorrectly given as Clerkenwell 6571; this should have been Monarch 8515.

Discussion of Table

In *England and Wales* notifications of measles decreased by 690 as compared with the previous week; other decreases included whooping-cough 187, scarlet fever 184, and pneumonia 40. There were increases in the incidence of acute poliomyelitis 146, diphtheria 26, cerebrospinal fever 17, and acute polio-encephalitis 5.

The largest decreases in the notifications of measles occurred in Northamptonshire 115, where an abnormally large number of cases were notified in the previous week, Staffordshire 96, Cheshire 64, and seven other counties in which the decrease was between 50 and 60 cases. From Glamorganshire 97 more cases were reported than in the previous week, while other increases included Devon 66, Southampton 64, and Durham 56.

Differences between the notifications from individual counties for the two weeks were generally small in respect of whooping-cough and scarlet fever. The largest decrease in the notifications of whooping-cough was reported from Warwickshire 58.

There was an increase of 146 in notifications of acute poliomyelitis. The number of counties now involved in England and Wales is 43, and six of these reported fresh cases for the first time during the eight weeks in which the number of notifications has been increasing: Huntingdonshire 1, Cambridgeshire 2, Soke of Peterborough 1, Norfolk 1, Shropshire 1, and Montgomeryshire 1. The largest increases over the figures for the previous week were Durham 25, Lancashire 19, Yorkshire West Riding 18, Surrey 17, Yorkshire East Riding 13, and Staffordshire 11.

In *Scotland* the number of notifications of acute poliomyelitis was 9 more than in the previous week, while a decrease of 13 was recorded for dysentery and 63 for pneumonia.

In *Eire* 32 cases of scarlet fever, an increase of 7 on the previous week, were recorded. Cases of poliomyelitis numbered one less than the week ending July 26.

In Northern Ireland the number of cases of poliomyelitis reported was 4 more than in the previous week.

Quarterly Returns for Northern Ireland

The birth rate for the quarter ended Mar. 31, 1947, was 24.9 per 1,000 population, compared with 21.9 for the corresponding quarter of the previous year; this is the highest rate recorded for the first quarter of any year since Northern Ireland became a separate administrative unit. The infant mortality rate of 60 per 1,000 registered births is the lowest recorded for a March quarter. A maternal mortality rate of 1.7 per 1,000 births was recorded, compared with 3.3, the average for the corresponding quarters of the previous five years. The death rate from all causes was 17.7 per 1,000 of the estimated population and exceeded that of the first quarter of 1946 by 1.3. The death rate from all forms of tuberculosis was 0.94 per 1,000, as in the March quarter of the previous year, while that from cancer was 1.53 per 1,000, compared with 1.48.

Week Ending August 9

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 680, whooping-cough 1,508, diphtheria 138, measles 5,488, acute pneumonia 225, cerebrospinal fever 66, acute poliomyelitis 568, acute polio-encephalitis 56, dysentery 78, paratyphoid 7, and typhoid 9.

Medical News

Medical Education in India

Lord Moran presided at a luncheon at Brown's Hotel, Dover Street, on Aug. 14, when members of the medical profession in London were invited to meet Dr. R. G. Cochrane, director of the Christian Medical College, South India. Introducing Dr. Cochrane, Lord Moran referred to his work in the field of leprosy and to the importance of his present post in medical education in India, about which he invited him to speak. Dr. Cochrane mentioned the special significance of the day in the history of India. He told of the improvement in the relations and feeling between Indians and British which took place immediately the date for Indian independence was fixed, and said that there was at the present time a great opportunity for co-operation and mutual help between the three countries. In the realm of medicine a special field for such service existed in the Christian Medical College at Vellore in South India, about 90 miles west of the city of Madras. This College was training men and women students for the M.B., B.S. degree of the University of Madras and was the only institution of its grade in the country under Christian control and direction, being both interdenominational and international in its support. He specially emphasized the need for setting and maintaining a high standard of medical practice and conduct in India where there was an ever-present tendency to praise and use the old Ayurvedic system.

Electroencephalography

An international meeting of electro-encephalographers sponsored by the Electroencephalographic Society was held at the National Hospital, Queen Square, London, on July 14–16, over 50 representatives from Europe and America being present. The opening discussion was on E.E.G. technique, including electrode material and electrode placements, and it was stated that the recommendations for the performance of apparatus issued by the American Society of Electroencephalographers conformed very closely with the existing British practice. A committee was formed to examine the possibilities of an international journal of electroencephalography. On the second and third days the physiological and clinical aspects of the E.E.G. were discussed, and an account of a new method of spatial analysis was given by W. Grey Walter (Burden Neurological Institute). The meetings concluded with a review of twenty years of electroencephalography, opened by Dr. E. A. Carmichael (National Hospital). During the proceedings Dr. H. H. Jasper (President, American Society of Electroencephalographers) expressed the view that, from what he had seen, Great Britain was in advance of the rest of the world in E.E.G. technique.

Medical Sickness Society

A year of outstanding progress was reported at the annual general meeting of the Medical Sickness, Annuity, and Life Assurance Society, Ltd., held at 7, Cavendish Square, W.1, on July 15. Mr. R. J. McNeill Love, M.S., F.R.C.S., Chairman of Directors, said that during the year the new business, amounting to well over half a million pounds, had substantially exceeded the previous record in 1938, and had more than doubled—in the Sickness Fund had almost trebled—the figure for 1945. The total membership of the Society now exceeded 10,000 doctors and dental surgeons. The Life Assurance Fund had passed the two million mark, with an annual premium income of over £185,000. The Sickness Fund also had attracted a large number of new contracts, owing partly to the demand for insurance by those who had been in the Forces and partly to the need felt by existing members to increase their frequently inadequate pre-war insurances. The total invested funds stood at £3,448,000. The Society's experience in respect of policies for sickness and accident insurance (Mr. Love continued) had been extremely favourable, and it was now possible not only to restore the pre-war rate of bonus but slightly to improve upon it. A reversionary bonus on the principal types of policy was now proposed at the record rate of 16s. for each guinea per week insured, meaning that a policy for 10 guineas per week which had been in force for five years would receive an allotment of £40 bonus to be paid at its termination or at the previous death of the insured. The Directors' Report and Accounts and the Valuation Report were adopted, and the recommendations for reversionary and interim bonuses on the various policies were agreed to. The Valuation Report revealed a total surplus on the sickness and life assurance funds of £393,332. Mr. McNeill Love and Dr. A. H. Douthwaite, who retired by rotation, were re-elected directors, and Messrs. Sturges, Fraser, Cace and Co., auditors.

The proceedings closed with a vote of thanks to the chairman, moved by Mr. Lancelot Bromley, and seconded by Sir Cecil Wakeley.

British Institute of Radiology

Sir Ian Fraser, M.P., proposed the toast of Radiologists, coupled with the name of Dr. Richard Fawcitt, President of the Northern Branch of the British Institute of Radiology, at a dinner held at Newby Bridge, Lancs, after the annual conference. Remarking that making a speech was not dissimilar from having a baby—it was easier to conceive than to deliver—he briefly reviewed the developments of radiology, and mentioned in particular its services to the Armed Forces, where mass radiology was becoming commonplace. It should be universal. He concluded by paying a tribute to Dr. Fawcitt for his work in radiology in general and for the help he had rendered to the citizens in that part of England, notably the submarine crews that had sailed from Barrow.

Cytological Congress

The Sixth International Congress of Experimental Cytology was held in Stockholm on July 10–17 under the presidency of Prof. Johan Runnström. The American biochemist Prof. A. Mirsky described his methods of isolating chromosomes and of investigating their chemical composition, emphasizing that his researches confirmed the results obtained by Prof. T. Caspersson. Prof. Astbury surveyed the possibility of explaining biological processes in the cells with the aid of *x*-ray spectrography and the electron microscope. Prof. P. de Fonbrune, of France, showed by means of a film how he removed the nucleus from a living cell and inserted it into another, and Dr. A. F. W. Hughes lectured on new methods for measuring the viscosity of the cell liquid. A large cyclotron is being constructed at the Physico-Chemical Institute, Uppsala.

Condensed Milk

A circular from the Ministry of Food announces that those receiving household milk powder on medical grounds may be supplied instead with equivalent quantities of machine-skimmed sweetened condensed milk, applications for which should be made to the local Food Office.

Knight of the Order of St. Olav

The decoration of Knight (First Class) of the Royal Norwegian Order of St. Olav has been conferred upon Dr. C. Bowdler Henry in recognition of services rendered during the war.

Mental Health Service

A circular from the Ministry of Health points out that under the National Health Service the administrative functions of the Mental Health Service will be transferred to the Minister, leaving to the Board of Control the quasi-judicial functions relating to the liberty of the subject. A Mental Health Division of the Ministry of Health has been established and the members and staff of the Board of Control have been assigned to it.

Royal Free Hospital School of Medicine

The name of the London (Royal Free Hospital) School of Medicine for Women has been changed to the Royal Free Hospital School of Medicine, by which title the School will be known henceforth.

N.H.S. Executive Councils

Executive Councils to administer locally the general medical services under the National Health Service are being set up—normally one for each county or county borough. A chairman appointed by the Minister of Health will preside over each Council, and of the 24 other members 8 are appointed by the local authority, 4 by the Minister, 7 by the local medical committee, 3 by the local dental committee, and 2 by the local pharmaceutical committee. Doctors and others taking part in the family practitioner arrangements under the Act will be in a contractual relationship with these Councils. An ophthalmic service committee, which will include members appointed by the Executive Councils, will run the ophthalmic service.

Wills

Dr. Brice Collyer, of South Croydon, who died on Jan. 13, left £33,613. Dr. Arthur Mantell Daldy, of Hove, left £37,187. Dr. Edward Tyson, of Ulverston, Lancs, left £17,746.

COMING EVENTS

R.C.P. Dinner

In connexion with the International Conference of Physicians, the programme of which was printed in the *Journal* of June 21 (p. 895), the Royal College of Physicians of London has arranged a dinner to be held at the Guildhall on Wednesday, Sept. 10, at 7 p.m. for 7.30 p.m.

APPOINTMENTS

The Minister of Health has approved the appointment of Mr. J. E. Pater to be an Under Secretary.

Harold Davis, Ph.D., F.R.I.C., who has been chief pharmacist at University College Hospital since 1929, has been appointed Chief Pharmacist to the Ministry of Health.

Geoffrey Commeline Williams, O.B.E., M.R.C.S., L.R.C.P., medical officer of health for the County Borough of Oxford, has been appointed Senior Administrative Medical Officer of the Oxford Regional Hospital Board, and Mr. George Watts, secretary of the Berks, Bucks, and Oxon Regional Hospitals Council of the Nuffield Provincial Hospitals Trust, has been appointed secretary of the Board.

William Patterson Forrest, L.R.C.P.&S.Ed., D.P.H., has been appointed assistant director of the headquarters office of the World Health Organization Interim Commission in New York City.

Dr. Forrest was formerly chief medical officer with the United Nations Relief and Rehabilitation Administration's Ukrainian mission.

DRUMMOND, J. C., M.Ch.Orth., F.R.C.S.Ed., Temporary Surgeon, North Middlesex County Hospital.

RUGBY: HOSPITAL OF ST. CROSS.—*Ophthalmic Surgeon*, T. J. P. Kerwick, M.B., B.Ch., D.O.M.S. *Dermatologist*, J. Overton, M.D., M.R.C.P. *Surgical Registrar*, F. J. C. Matthews, F.R.C.S. *Orthopaedic Registrar*, K. L. Marks, F.R.C.S.

BIRTHS, MARRIAGES, AND DEATHS

The charge for an insertion under this head is 10s. 6d. *for* 18 *words or less. Extra words* 3s. 6d. *for each six or less. Payment should be forwarded with the notice, authenticated by the name and permanent address of the sender, and should reach the Advertisement Manager not later than first post Monday morning.*

BIRTHS

HAMILTON.—On Aug. 13, 1947, at the Nottingham Women's Hospital, to Margaret (*née* Baker), wife of Dr. R. J. C. Hamilton, a son—Stephen Fraser.

HEATH.—On July 13, 1947, to Mickey (*née* Moxon) and Christopher Heath, o St. Day, Cornwall, a daughter.

MANNING.—On Aug. 12, 1947, at Wilmar Lodge, to Mary (*née* Ford), wife of Dr. F. R. C. Manning, of Epsom, a son.

MOLL.—On Aug. 15, 1947, to Dr. and Mrs. F. C. Moll, 84, Andover Street, Sheffield, 3, at the Jessop Hospital, a son—John Graeme Francis.

TWEEDIE.—On July 27, 1947, at Liverpool, to Gladys Blatcliffe (*née* Telford), wife of George Carrick Tweedie, a daughter.

MARRIAGES

JEFFERSON—HUGHES.—On Aug. 16, 1947, at Oswestry, Dr. A. A. Jefferson to Dr. M. Eirlys Hughes, M.R.C.P.

SMITH—MACBRIAR.—On Aug. 16, 1947, at Glasgow Cathedral, Dr. Alastair William Smith, M.B.E., to Sheila Mary Macbriar.

WHITE—MITCHELL.—On Aug. 11, 1947, at Whitley Bay, Northumberland, Lieut. Albert Edward White, R.A.M.C., to Lieut. Jean Haddow Mitchell, R.A.M.C.

DEATH

CAMPBELL.—On July 31, 1947, at Glenmore, Lochs, Stornoway, Donald Campbell, M.B., Ch.B., J.P., husband of Mary Campbell and father of Evelyn, Nanna, and Callum, aged 59.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Poliomyelitis and Swimming-baths

Q.—*What is the precise position as to swimming-baths and anterior poliomyelitis? Should a swimming-bath be closed in an area in which there have been cases and, if so, why?*

A.—There is no concrete evidence that swimming-baths have contributed to the spread of poliomyelitis. Whether they are likely to do so or not depends to some extent on the mode of spread of the infection. If spread is mostly by the respiratory route, close contact among children in an overcrowded pool may facilitate the transfer of infection. Bath superintendents should therefore limit the number of children admitted to the baths in areas where poliomyelitis has occurred. Further, since exhausting exercise may predispose to the paralytic stage in an infected child, the time for which children stay in the swimming-bath should be strictly limited. If, on the other hand, the intestinal mode of spread is the more important, chlorination of the water to maintain 0.2–0.5 p.p.m. free chlorine will at least minimize the risk of infection, since approximately 0.2 p.p.m. chlorine destroys poliomyelitis virus in ten minutes. Frequent bacteriological examinations will reveal whether or not the chlorination is being efficiently done. Hired swimming suits and towels should be washed in hot water and laundered between use; changing-cubicles should be kept clean. If these conditions are observed, the swimming-bath is unlikely to be more dangerous than the street where children play together. Non-chlorinated stagnant bathing-pools and children's paddling-pools may be more likely to spread infection by becoming grossly polluted. They should be avoided or closed in an infected area.

Abortifacient Pastes

Q.—*I have a patient who I suspect is six weeks pregnant; if so, a therapeutic abortion is indicated. Can you tell me how this may be obtained with the least trouble to the patient; she is terrified of having an anaesthetic? Are abortifacient pastes effective?*

A.—The reply to this question depends to some extent on the indications for terminating the pregnancy, and on other factors such as the parity of the patient and whether the cervix is tightly closed. Induction of abortion is never such a simple procedure as might be expected, and methods which involve the least trouble for the patient are often inefficient or dangerous, or both. Could not this patient's objection to general anaesthesia be overcome by use of an intravenous anaesthetic? If not, the insertion of laminaria without anaesthesia should be considered. Dilatation of the cervix and evacuation of the uterus, using local analgesia, is also a possibility.

Mention of abortifacient pastes deserves comment at some length. Several of these pastes have been marketed on the Continent, in the U.S.A., and in this country since about 1930. They consist essentially of alkaline soaps medicated with iodine and astringents. They have a strong haemolytic and cytolytic action and act by chemical rather than mechanical irritation of the uterine wall. The paste is injected (through the special cannula supplied with the tubes) into the lower part of the uterus, outside the membranes, the amount depending on the duration of pregnancy. Expulsion of the ovum generally takes place twenty-four to thirty-six hours after injection. Anaesthesia is not required, but the injection should be made slowly, without pressure and with due regard to asepsis. If there is any pain or bleeding the injection should be stopped at once. The method should never be used during the first six weeks of pregnancy, otherwise the paste may escape past the small ovum and enter the Fallopian tubes and peritoneal cavity. The above instructions are based on those issued by manufacturers of these pastes.

The advantages of inducing abortion by this means are simplicity in technique and avoidance of anaesthesia. Although the method is often successful, however, reports indicate that the process of expulsion of the ovum is sometimes protracted for as long as five or six days, and operative intervention to complete the abortion is required in 10 to 20% of cases. It is claimed that this method avoids the danger of rupture of the uterus and laceration of the cervix which attends other procedures. Nevertheless, such risks are not excluded and cases of perforation of the uterus by the cannula are recorded. In early pregnancy at least, the paste may pass through the tubes, giving rise to pain and collapse, and even peritonitis. At any time during pregnancy there is a real risk of endometritis and salpingitis, which are sometimes associated with extensive necrosis of the uterine wall and neighbouring tissues. Apart from post-mortem findings, animal experiments confirm that these pastes can cause necrosis of the uterus. They have been shown to penetrate the myometrium and can enter the chorio-decidual space and the maternal blood sinuses. In the blood stream they may produce general and severe haemolysis, resulting in jaundice and sometimes death. Fatal multiple micro-emboli are recorded, and so are pulmonary embolism, septicaemia, systemic poisoning, and kidney and liver lesions. Other sequelae mentioned in the literature are chronic pelvic infections and sterility. Even when major complications are avoided, the bleeding following the abortion tends to be unusually heavy and prolonged.

Cases illustrating all these types of ill effects are described by R. W. Weilenstein (*J. Amer. med. Ass.*, 1944, **125**, 205), who also gives many references to the Continental medical literature, all of which indicate the dangers of abortifacient pastes. By 1932 there were already reports of at least twenty-five fatalities in the German literature alone. In that year the American Medical Association published a report (*J. Amer. med. Ass.*, 1932, **98**, 215) calling the attention of the medical profession to the dangers of this method of inducing abortion, and the same journal has since given repeated warnings in its editorials. It is only in recent years that the use of abortifacient pastes has received much attention in this country, but they now appear to be obtaining adherents who are naturally attracted by the simplicity of the method and do not always appreciate the risks.

Starting a Mental Home

Q.—*Could you give me any information on starting a small home for mild mental cases not requiring certification? Are there any statutory requirements for nursing staff, and is a licence needed? What would be the probable position under the new health service? Can you tell me the prospects of filling such a home for, say, 12 patients where the charges are moderate? What is the position as regards certified patients?*

A.—Such a home is in law a nursing home and must be licensed by the local authority. This is the county or county borough council, or the borough or district council if powers have been delegated to it. The authority may refuse a licence on account of unfitness in the applicant, employees, situation, construction, state of repair, accommodation, staffing, or equipment. The home must be in charge of a resident doctor or qualified nurse, and there must be a proper proportion of qualified nurses on the staff. What proportion is "proper" is left to the judgment of the licensing authority, and depends on circumstances. If any patient is potentially dangerous to himself or to others the Board of Control is interested: its approval is necessary, and the formidable Mental Health Rules must be observed. The new health service will not affect small nursing homes run for profit. If the food was good and the patients were happy, such a home would probably be besieged in these days. The Lunacy Act, 1890, stopped the licensing of new homes for certified patients.

Death Certificates

Q.—*On a death certificate are the words: "Last seen alive by me." What is the legal maximum time that can intervene between the last time a person is seen alive and the date of issuing the death certificate?*

A.—There is no legal maximum, but if the certificate shows that the practitioner did not see the deceased within fourteen days of death the registrar will report the case to the coroner.

Vitamin C Content of Fruit Squash Concentrates

Q.—*What is the vitamin C content in 1 fluid oz. of the fruit squash concentrates available to the public?*

A.—The vitamin C content of fruit squash concentrates will depend on the kind of fruit. Concentrates contain approximately 25% fruit juice with a preservative that is stated not to destroy the vitamin C. The vitamin C content of 1 fluid oz. (28.4 ml.) of any fruit squash concentrate should therefore be approximately one-quarter of what would be present in the fresh fruit juice. The following are the average figures for the vitamin C content of the fresh juice expressed in milligrammes per fluid oz. of juice: orange, 14; lemon, 14; grapefruit, 12; lime, 16. Deterioration of vitamin C occurs on storage, particularly if the fruit juice is exposed to the air.

Vital Statistics

Q.—*Where may I obtain vital statistics relating to the incidence and mortality of the commoner diseases during the last half-century? I should also like to consult figures concerning the application of modern chemotherapy to such diseases.*

A.—Deaths by causes are published in the Annual Reports and Statistical Reviews of the Registrar-General. No statistics are available for morbidity, and with the exception of the notifiable diseases nothing is known about the incidence of various diseases. Although some information as to the amount of sickness has been published in the *Monthly Bulletin of the Ministry of Health and the Public Health Laboratory Service*, these data were collected by the Social Survey. Except for articles in the medical press there are no data relating to chemotherapy and its application to disease. Chemotherapy is now generally employed for many conditions, and the comparison usually made is between mortality now and before the introduction of chemotherapy.

Silicates and Pneumoconiosis

Q.—*There is conclusive evidence that free silica causes silicosis and that asbestos causes asbestosis. Is there any clear evidence that silicates apart from asbestos cause either pneumoconiosis or fibrosis?*

A.—There is no clear unequivocal evidence that pneumoconiosis or fibrosis of the lung is caused by silicates apart from asbestos. Claims have been made that silicates do act in this way, but investigations have been inadequate either to substantiate or to refute completely such claims. It is true that certain pulmonary changes have been produced by silicates, and individual cases of fatal disease have been recorded in which silicates other than asbestos appeared to have been the cause, although the radiological and pathological signs which characterize silicosis were not found. Such were described by Mavrogordato in workers in a norite quarry and by Badham in workers in orthoclase basalt and the miners of Broken Hill. Pulmonary changes, both clinical and radiographic, have been found among workers exposed to dusts of talc, china clay, sillimanite, and mica, but in experimental studies Gardner found no support for a belief in the capacity of silicates other than asbestos to provoke progressive fibrosis. In considering this question regard must be had to possible influences such as the presence of infection, the importance of the time factor, and the incompleteness of factual data on the effects of mixed dusts.

Examination of Saliva

Q.—*In a healthy girl of 16 many carious cavities continue to form in spite of her taking plenty of milk and a sufficient dosage of calcium and vitamin D in addition for the last two years. Her teeth are said to be soft and crumbling, and the dentist suggests a test of the saliva for acidity. What, if any, examination of saliva should be asked for, and what further constitutional treatment is possible?*

A.—The examination of saliva to test the *p*H is extremely fallacious. The only true method of ascertaining the salivary *p*H is to pass cannulae into the orifices of the ducts under oil. Samples of saliva taken from the mouth in the ordinary way vary greatly in *p*H in relation to the amount of carbon dioxide dissolved; any variation in *p*H merely reflects, therefore, the carbon-dioxide content at that particular time. Treatment should be directed towards local hygiene in the mouth, with a diet as high as possible in roughage and cleansing foods, particularly at the finish of meals. Evidence that constitutional treatment is of benefit after the teeth have erupted is very inconclusive.

Stability of Penicillin in Oil

Q.—*What is the best method of using penicillin when only about two injections are possible daily? What are the keeping properties of penicillin in wax and oil?*

A.—A large dose can be given twice daily in ordinary solution; the merits of this proceeding have been discussed in answers to several recent questions (Jan. 25, p. 167; Feb. 1, p. 207; April 19, p. 551). A more prolonged effect, as judged by blood levels, can be obtained by the same dose given in suspension in oil. The best preparation of this kind is calcium penicillin suspended in beeswax–peanut oil, as recommended by Romansky and Rittman. This material is one of the most stable of all penicillin preparations; there is no fear of its deterioration within any reasonable time. The suspension in ethyl oleate which has recently been manufactured in this country does not exert so prolonged an effect.

NOTES AND COMMENTS

Removal of Placenta.—Mr. ARTHUR CLIFT, F.R.C.S. (Croydon Obstetric Unit), writes: Referring to the excellent answer on this subject (Aug. 2, p. 195), the last paragraph, dealing with the modern treatment of retained placenta by the intravenous administration of ergometrine, states: "If, however, the placenta does not come away at once, manual removal has to be carried out *without delay*." It should be stressed that an attempt should be made to expel the placenta about 45 seconds after the administration of the ergometrine (this may be given intravenously or, as Prof. Moir has suggested, into the uterine muscle through the abdominal wall), i.e., as soon as the uterus firmly contracts; otherwise the uterus may so firmly contract on to the placenta that its expulsion is rendered impossible. It is not usually possible to remove the placenta manually for up to some thirty minutes after the injection of ergometrine, as the uterus is so firmly contracted as to prevent introduction of the hand. During the period of awaiting relaxation (half an hour) after the injection has been given (in cases where the expulsion of the placenta has failed) there need be no cause for anxiety, as no further bleeding or additional shock occurs. Prompt use of this modern method of treatment can greatly reduce the incidence of post-partum haemorrhage with all its worrying sequelae. (See also Prof. Chassar Moir's letter at p. 309.)

Fissured Lip.—Dr. H. R. VICKERS (Sheffield) writes: I agree with Dr. F. F. Hellier (July 19, p. 120) that ill-fitting dentures are a common cause of fissured lip, but in a few of these cases the patients have a definite sensitization to the material of which the denture is made. During the last two years I have had three such patients referred to me. The presenting symptom in each was persistent fissuring at the angles of the mouth, present in all for several years, and all types of local treatment and vitamin therapy had failed. On examination, in addition to the fissuring, the buccal mucous membrane in contact with the denture was markedly red and engorged. Patch-testing, using the denture material applied to the upper arm, was in each case strongly positive after 48 hours. Two patients had vulcanite dentures, the other had the acrylic type. They each now have dentures of material to which they gave a negative patch test, and they are all cured. A fuller account of these cases is in the course of preparation.

Second Childhood.—Dr. B. DAMER MERRIN (Stockport) writes: A patient of mine, a male, aged 82, has just cut a wisdom tooth. Is this a record?

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